

**WAGE DIFFERENTIAL BETWEEN FORMAL AND
INFORMAL EMPLOYMENT IN NEPAL**

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**BY
SANDEEP SHARMA
ROLL NO: 16/074
TU REGISTRATION NO: 6-3-28-149-2017
CENTRAL DEPARTMENT OF ECONOMICS
TRIBHUVAN UNIVERSITY
KIRTIPUR, KATHMANDU, NEPAL.
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DECLARATION

This thesis entitled, “WAGE DIFFERENTIAL BETWEEN FORMAL AND INFORMAL EMPLOYMENT IN NEPAL”, was conducted under supervision of Assistant Professor Resham B. Thapa, PhD of Central Department of Economics, Tribhuvan University. I declare that the information reported in this thesis is the result of my own work, except where due reference has been made. The thesis has not been accepted for any degree nor has been concurrently submitted to for candidature in other degree granting programs.

Date: January 03, 2023 A.D.

.....
Sandeep Sharma
TU Reg. No: 6-3-28-149-2017

LETTER OF RECOMMENDATION

This thesis entitled, “WAGE DIFFERENTIAL BETWEEN FORMAL AND INFORMAL EMPLOYMENT IN NEPAL”, is submitted by Mr. Sandeep Sharma under my supervision for partial fulfillment of the requirements for the degree of MASTER OF ARTS *in* ECONOMICS. I forward it with a recommendation for approval.

Date: January 03, 2023 A.D.

.....
Resham Thapa-Parajuli, PhD
Thesis Supervisor

APPROVAL LETTER

We certify that this thesis entitled, “WAGE DIFFERENTIAL BETWEEN FORMAL AND INFORMAL EMPLOYMENT IN NEPAL” submitted by Mr. Sandeep Sharma to the Central Department of Economics, Faculty of Humanities and Social Sciences, Tribhuvan University, in the partial fulfillment of the requirement for the MASTER OF ARTS *in* ECONOMICS has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the said degree.

Thesis Committee

.....
Prof. Shiva Raj Adhikari, PhD
Head of the Department

.....
Professor
External Examiner

Date: January 03, 2023 A.D.

.....
Resham Thapa-Parajuli, PhD
Thesis Supervisor

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Sandeep Sharma
Kirtipur

ABSTRACT

This research investigates the wage gap between formal and informal employment in Nepal using data from the Nepal Labor Force Survey (NLFS) III. We employ OLS regressions and Oaxaca-Blinder decomposition to examine the influence of various factors, such as education, experience, occupation, firm size, and sector of employment, on wages in formal and informal employment. Our findings indicate that formal workers earn higher wages and that the wage gap between formal and informal employment is significant, with informal workers earning approximately 64.77% less than formal workers. Additionally, we find that informality is correlated with lower wages and that factors such as occupation class, firm size, and sector of employment all have a significant impact on wages in informal employment. The results of this study suggest that policies aimed at formalizing informal employment and enhancing the skills and education of informal workers could reduce the wage gap and improve economic security for informal workers in Nepal.

Key words: Wage gap differential, Mincerian wage model, Oaxaca-Blinder decomposition, Informal employment

JEL codes: J3, J31, C21, J2

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LIST OF ABBREVIATIONS

CBS	Central Bureau of Statistics
CDF	Cumulative Distribution Function
GoN	Government of Nepal
GM	Geometric Mean
IMR	Inverse Mills Ratio
NLFS	Nepal Labour Force Survey
NLSS	Nepal Living Standard Survey
NPC	National Planning Commission
NSCO	Nepal Standard Classification of Occupation
NSIC	Nepal Standard Industrial Classification
OB	Oaxaca and Blinder
OLS	Ordinary Least Square
PDF	Probability Density Function
PRG	Percentage Relative Gap
PSU	Primary Sampling Units
SC	Scheduled caste
SSU	Secondary Stage Units

CHAPTER I

INTRODUCTION

1.1 Background of the study

The informal sector of the economy is associated with lower earnings, higher risks, limited economic opportunities and legal protection as well as being unable to exercise their economic rights and collective voice. International Labour Organization refers to Informal Economy as ‘...all economic activities by workers and economic units that are- in laws or in practice – not covered or insufficiently covered by formal arrangements, while restricting these economic activities to income generating activities involving the sale of legal goods and services (Charmes, 2012). Over 61% of people who are employed worldwide make their living in the informal economy while remaining outside the protection and regulation of the state as an informal employee (Gerxhani, 2004) . The need for the understanding of the size and composition of the informal economy, what drives or causes it, and what linkages exist between formality and growth, poverty and inequality remains a major policy discourse in the study of informality (Chen, 2012)). Informality is not just a distinctive element of the informal sector but also a prevalent feature of the formal sector where it coexists alongside formal employment. Workers in the informal economy are not included and addressed in the recognition, registration, registration, and protection of labor laws and social protections of a nation, which leaves them vulnerable and powerless.

In the formal economy, workers are often able to negotiate better wages and working conditions because they are protected by labor laws and have the support of trade unions and other organizations. However, workers in the informal economy often have little bargaining power and are forced to accept lower wages and poor working conditions. An employee is entitled to social security payments, paid annual leave, paid sick leave, illness or injury benefits, and parental leave if they are registered for a permanent contract. Although informal employment does not promise these job securities, it does offer more flexibility in terms of working hours. Employers in the formal and informal sectors value occupations differently as a result of this disparity (Ben Yahmed, 2018). Therefore, it is crucial to address jobs in the formal and informal sectors via distinct labor market policies.

Along with differences in market dynamics, job opportunities, and legal protection between formal and informal workers, there are also significant differences in their earnings and risk taking. The disparity is even more pronounced in developing countries, where the majority of workers are engaged in informal employment. In these countries, workers in the informal economy often face significant challenges in terms of access to education, healthcare, and other basic services. This can lead to a lack of opportunities for upward mobility and a cycle of poverty that is difficult to break. Workers in the informal economy often have limited education and skills, which makes it difficult for them to secure formal employment and earn higher wages. In addition, the lack of labor laws and regulations in the informal economy means that employers can pay workers lower wages without facing any consequences.

Nepal has struggled with economic development compared to the rest of South Asia due to a large trade deficit and an economy heavily reliant on remittances. In 2020-2021, imports made up 36.09% of GDP and remittances contributed 22.53% (NPC, 2020). The industrial sector has decreased in its contribution to the economy and the trade deficit remains high. While gross domestic product increased from RS. 1599.22 billion in 2010-11 to RS. 2382.71 billion in 2020-2021, the past decade has seen fluctuating growth rates, reaching a peak of 8.98% in 2016-17 due to increased post-earthquake infrastructure and a low of 2.09% due to the pandemic's impact on economic activity. Approximately 28.6% of the population in Nepal lives in multidimensional poverty, with a Gini coefficient of 0.31. (CBS, 2019)

According to the Report on the Nepal Labor Force survey 2017/18 CBS (2019), more than 60% of the 7.1 million persons who were working were men. With 41% of all jobs, the non-agricultural informal sector was the largest contributor to overall employment. 36.5 percent of all jobs were in the official non-agricultural sector. Twenty-two percent of all jobs were in informal agriculture, which also accounted for 1.3 percent of all jobs and one percent of all jobs were in private households. The sector of non-agriculture that employed the most men was the informal non-agriculture sector (45.8%), which was followed by the formal non-agriculture sector (39%) With corresponding shares of 32.3 percent, 31.8 percent, and 32.9 percent, females were fairly evenly divided among the formal non-agriculture, informal agricultural, and informal non-agriculture sectors. Comparatively, 0.6 percent of men and little under 2 percent of women worked in private households. We choose the non-agriculture informal sector as the theoretical framework of the study as measuring the agriculture sector is challenging because the majority of the sector operates under informal mechanisms.

In Nepal, about 500,000 workers enter job market each year. 93 percent of the 15.7 million persons who were employed in 2018 were working in the informal sector. A little more than 3.3 million of the 3.8 million wage workers in 2018 had formal jobs in the private sector, 180,000 had formal jobs in the public sector, and 380,000 had formal jobs in the unofficial sector. Although agriculture still employs six out of ten workers in Nepal, it only contributes to about one-third of the country's total output. More than half of the workforce does not create enough surplus to sell on the market due to the underdevelopment and low productivity of the agriculture sector, which is primarily focused on food crops (NPC, 2020).

Nepal's economy has progressively transitioned over the past two decades from one dependent on agricultural and a bigger subsistence economy to modern industry and services, which is attributable to a higher population entering the construction, manufacturing, commerce, and transportation sectors (Bulmer et al., 2020). Even though these jobs help people live better lives in the traditional low-productivity farm work, most of them are undocumented or temporary wage jobs that don't guarantee productivity on the supply side and come with risky working conditions, no protection from associated unforeseen risks, no written contract, no social security contributions, and no paid annual leave. In an environment driven by global economic competition, it is challenging but also right to create acceptable working conditions for the informal workers to get out of precarious circumstances in the job. However, the majority of Nepal's employment and work laws, which are essentially only focused on the official sector, do not apply to the informal sector. Due to a lack of employment prospect, legal and administrative protection and entry to open markets in Nepal, there has been a significant tendency of labor force migration overseas for employment.

Following the need to formalize informal workers and promote inclusive and employment-oriented economic growth, equitable income distribution, socioeconomic equality, and eventual increases in production and sectoral productivity, Nepal's 15th five-year plan (2018-2023) aspires to reduce the share of the informal sector in employment from 63.5 percent to 50 percent by 2023/24. Providing benefits such as pensions, healthcare and compensation makes formal employment more desirable and helps reduce incentive to work in informal sector who do not have access to the same benefits and protections. Social security system can help to level the playing field between formal and informal workers by providing benefits to workers in the informal economy. By extending social security coverage to informal workers, governments can help to reduce the wage gap between the two sectors and promote more equitable labor market outcomes.

A targeted program has been established with the goal of bringing all work-

ers under the social security system by gradually formalizing the informal sector and making decent employment opportunities available to the entire labor force by enhancing integrity, accountability, and competition in all economic activities. Currently, 38.5% of people in the population who are 15 years of age or older are employed, and 17% of those people are enrolled in the social security program, which accounts for 11.7% of the overall budget. Nepal government intends to make considerable progress in the areas of social and economic development, including industrialization, production and productivity, social security, and inclusion leading to economic growth via providing all working-age citizens with full and productive employment possibilities, regardless of their personal and household circumstances, employment situation, or employer (NPC, 2020).

1.2 Statement of problem

The majority of employment in Nepal's labor market is informal, with 59.2% of all employment in non-agricultural sectors falling under this category (CBS, 2019). Informal employment as a safety net is essential to understanding the informality of the labor market. The economic impact of informal employment on Nepal's economy includes inefficient resource allocation, tax evasion, unfair competition and labor market distortion. Although a large number of people and households in Nepal rely on informal employment, the disadvantages outweigh the benefits for each person, each household, each business, and the nation's economy as a whole. Nepal's labor and employment laws and policies have the power to have an impact on the economy and informal jobs, however, due to Nepal's shifting political landscape, a lack of funding, political pledges, and bureaucratic failures in responding to workers' pressing needs, its implementation has been inconsistent and flawed. More than half of the population works in the unorganized sector and is not covered by social security. The government is working to enroll this group of people in the social security program. In order to achieve synchronized growth across all sectors, policymakers must pay attention to this formal-employment nexus within the current varied labor force participation. From the standpoint of formulating policies, it is crucial to evaluate the formal-informal disparities as well as the variables influencing the determinants of differences.

The research questions of the study are presented as follows:

- i Is there a wage gap differential across formal and informal employment in Nepal?
- ii What are the factors to explain disparity in the wage across formal informal employment nexus in Nepal?

1.3 Objectives of the study

The proposed study is aimed to analyze the differences among the determinants of wage gap earning of workers within formal- informal employment nexus in Nepal. The research objective of the study is aimed at the following:

- i To investigate if there is a wage differential between the formal and informal employment in Nepal and the extent of such difference.
- ii To investigate the key factors explaining the wage differential between the two employment sectors.

1.4 Significance of the study

A gap between the structural design of the government and the actual needs of informal workers is revealed by an examination of the literature that has already been published. As a result, the risk factors has increased, strengthening the grip of informality in the country's economy. The formal-informal wage gap is essential to understanding the informality of the labor market, particularly in developing nations where there is a big informal sector and consequently a large informal labor force. The economic impact of informal employment on developing nations' economies includes inefficient resource allocation, tax evasion, unfair competition, and labor market distortion. Although a large number of people and households in Nepal rely on informal employment as a safety net, the disadvantages outweigh the benefits for each person, each household, each business, and the nation's economy as a whole due to the unstable working conditions, lack of protection from unforeseen risks, lack of a written contract, lack of social security contributions, and lack of paid annual leaves.

The negative effects of the economic, occupational, societal, and political pressures informal workers are subjected to can have a significant impact on their ability to endure shocks. Additionally, as there are no institutional safeguards or safety nets to secure their welfare and wellness, informal workers suffer a terrible lack of security for themselves and their family. Economic risks impact informal workers disproportionately as compared to formal sector workers, making them more vulnerable to negative effects of disasters and unpredictable shocks. Lack or informal sources of savings, high indebtedness, low and fluctuating income, absence of social security or minimum wage provisions majorly affect their economic status and recovery from setbacks. Absence of employment contracts, precarious and often hazardous working conditions increases informal workers vulnerabilities to health inequalities, physical and mental stress, workplace injuries, and even death.

Every Nepali citizen has the right to employment under the country's fundamental labor and employment laws and policies, which also have the power to

have an impact on the economy and informal jobs. However, due to Nepal's shifting political landscape, a lack of funding, political pledges, and bureaucratic failures in responding to workers' pressing needs, its implementation has been inconsistent and flawed. In recent years, Nepal has significantly improved the rights, facilities, compensation, safety, and security of workers in a number of Nepali sectors from a previously constrained policy structure. Although being far more inclusive and encouraging, recent changes to national acts and regulations still mainly ignore the informal sector employees, and labor laws and clauses designed to safeguard them have not yet been implemented. Protection of informal employees is a new topic that has not yet been handled in the current environment, where the rights and benefits of workers in the informal sector are only recently being acknowledged.

In signing the Sustainable Development Goals on 17 pillars, Nepal government is committed to funding and achieving full and productive employment, with decent work for all, 'Decent Work and economic growth', which contains the following target: 'By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value'. It is associated with dependable, inclusive, and sustainable economic growth as well as the promotion of a respectable working environment for the whole working-age population of the country. This encourages the formalization and growth of micro, small, and medium-sized businesses. In 2015, the same year that the UN adopted the SDGs, Nepal's new Constitution went into force. The SDGs strongly resound with the equity-based strategy and rapid development ambitions of the constitution, which was created to institutionalize the country's broad political, social, and economic developments (NPC, 2020).

Because of its significant consequences on inequality and poverty in Nepal, growth of informality may be dangerous for the growth of a robust business sector and a well-functioning market economy. Concerning the protection of workers against the social, political, occupational and economic vulnerability of their jobs, policy discussion is necessary. To determine the current vulnerabilities of informal workers, more research is needed in this area. These facts can support advocacy for rights-based reforms in policy making and aid to protect the rights of informal employees. The state of the informal workforce and informal employment, which is mostly "invisible" to government and policy makers, must thus be accurately assessed in order to better understand it and to avoid the negative effects of policy responses. This report provides the economic variables or components needed to address the issues surrounding the wage gap, its causes, and policy discourses to the Government of Nepal and stakeholders.

1.5 Scope and limitations of the study

The study incorporates data available from Nepal Labour Force Survey (NLFS III) which was conducted by the Central Bureau of Statistics in 2017/18. We test three specifications, namely, basic human capital, job characteristics and employer related characteristics. We also consider bias arising out of the differential selection of gender into the labor force and correct it using the Heckman (1979) method. The validity of our research results, which are based on a secondary data set, depends on the validity of the NLFS III data set and the tools used. We have confidence in the validity of the micro-data set because it was collected by a national statistical body that has conducted numerous surveys and censuses using established sampling methods. Additionally, the tools used in our study are well-established in the field of empirical labor economics. However, it is important to note that our study is a cross-sectional study, which means it is subject to the usual limitations of this type of study..

1.6 Outline of the study

The structure of the study is as follows: In Chapter 2, we present a review of relevant literature. In Chapter 3, we detail the methodology and data sources used in the study. The empirical results are reported in Chapter 4, and in Chapter 5, we discuss the findings and provide our conclusions.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This section reviews the relevant literature. Firstly, we analyze on the literature relating to informal employment. Next, we review literature relating to wage gap discrimination for labor force. Subsequently, we review literature relating to empirical studies and national studies.

Informal employment, also simultaneously referred to as shadow, underground, grey, hidden economy has been an elusive subject matter, as the context has been defined in different contexts with different uses.

2.2 Origin and development of informality

The discourse on formality and informality in the economy has been ongoing for over half a century. Dutch anthropologist Boeke (1942) proposed the theory of a dual economy, made up of a market-based sector and a non-market sector consisting of peasant households with different output-sharing norms. Arthur Lewis' two-sector model of growth in the 1950s also recognized this duality, with one sector being made up of modern capitalist firms and the other being made up of peasant households. The Harris and Todaro model in development economics integrated this duality into the traditional two-sector framework in the 1970s. Keith Hart's study in 1973 and the International Labour Office's mission to Kenya, which introduced the term "informal sector," both emphasized the importance and challenges of this dichotomy in development policy and research. (Guha-Khasnobis et al., 2006)

In 1991, the International Labour Conference (ILC) emphasized the need for a comprehensive and multi-dimensional approach to addressing the root causes and symptoms of informality. In 1999, the ILO's Bureau for Workers' Activities (ACTRAV) held a symposium on the challenges faced by trade unions in the informal sector and how to address them. The 2001 Director-General's report to the Conference highlighted the lack of social security, organization, and a voice at work for the majority of employees in the informal economy worldwide. In 1993, the 15th ILC defined an informal sector enterprise as a private unincorporated enterprise that is unregistered or small in terms of the number of employees. An

unincorporated enterprise is one that is not constituted as a separate legal entity independent of the owner(s) and does not keep complete accounts. An enterprise is unregistered if it is not registered under specific national legislation, such as factory or commercial acts, tax or social security law, or professional regulatory acts. An enterprise is considered small if it employs fewer than a certain number of employees, as determined by national circumstances. This definition of informality focused on the enterprise as the unit of analysis.

However, in 2003, the ILO (2017)'s 17th ILC recognized that informal employment exists in both formal and informal enterprises and that the enterprise-based definition of informality missed a significant amount of informality. As a result, the 17th ILC adopted the employment relationship as the unit of analysis and defined informal employment as jobs that lack basic social or legal protections or employment benefits. Informal employment was seen to include self-employed individuals working in their own informal sector enterprises, employees with informal jobs, members of informal producer cooperatives, and contributing family workers. These individuals may be found in the formal sector, informal sector, or households.

The conceptual framework of informal employment as defined by the 15th International Conference of Labour Statisticians (ILO, 2017) as “the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, or as the total number of persons engaged in informal jobs during a given reference period” by the International Labour Organization. In the Nepal Labour Force Survey, those in informal employment are identified and the residual is those in formal employment. Informal employment includes employers, own-account workers and contributing family workers who are employed in informal sector establishments, as well as employees and paid apprentices, interns who do not have paid annual leave or sick leave benefits and whose employers do not contribute to their social security.

In a study by C. C. Williams and Horodnic (2019), the prevalence of informality in 112 countries was analyzed using three theories: modernisation theory, which suggests that informality is a result of economic underdevelopment and a lack of modernized governance; neo-liberal theory, which proposes that informality is caused by excessive state interference in the free market; and political economy theory, which posits that inadequate state intervention to protect workers from poverty drives informality. The study aimed to understand which of these theories could best explain the prevalence of informality in different countries and inform policy efforts to address it.

2.2.1 Modernisation hypothesis

According to the modernization hypothesis, informal employment in poorer countries is a result of economic underdevelopment and a lack of modernization in governance, but will disappear as these countries undergo economic development and modernization (Gilbert, 1998) . This hypothesis posits that informal employment is a residue of premodern production and will eventually be replaced by formal economies, which are seen as "advanced" and "developed," while informal economies are viewed as "backward" and "underdeveloped." The modernization hypothesis suggests that informal employment is a temporary phenomenon that will disappear with the modernization of the political system and economic growth. Williams' study examined the validity of this hypothesis in the modern context (C. C. Williams & Horodnic, 2019).

2.2.2 Neo-liberal hypothesis

The neo-liberal hypothesis suggests that economies with higher tax rates and greater levels of government intervention in the free market will have a higher prevalence of informal employment (Williams, 2019). According to this hypothesis, even though economic development and modernization are recognized as important factors, the high levels of informality in some economies are seen as a result of excessive government interference in the economy and welfare. Informal employment is viewed as a voluntary economic choice made by employees and businesses who choose to leave the formal economy due to the high costs, time, and effort required to operate in it. Williams' study analyzed the neo-liberal hypothesis and its implications for understanding the prevalence of informality in different economies (Becker, 2010).

2.2.3 Political economy hypothesis

The political economy theory posits that economies with fewer levels of governmental action to protect workers from employment-related discrimination will have a higher prevalence of informal employment (Fernández-Kelly & Shefner, 2006). According to this theory, informality is not a temporary residue of premodern production, as suggested by modernization theory, but is an integral part of the processes of modernization and economic development. This theory holds that informal employment involves low-paid, insecure work performed under "sweatshop-like" conditions as a survival strategy by marginalized populations in an unregulated environment. This theory suggests that informality is not a voluntary economic choice, but is driven by the lack of legal protections and employment benefits for workers.

2.3 Labor market discrimination

Economists and sociologists have proposed various theories to explain discrimination in the labor market. In this review, we will focus on two of these theories: the "taste discrimination" theory proposed by Becker (2010) and the theory of "statistical discrimination" introduced by Aigner and Cain (1977). The taste discrimination theory suggests that employers may discriminate against certain groups due to personal preferences or biases. The theory of statistical discrimination proposes that employers may use statistical probabilities based on group characteristics, such as race or gender, to make decisions about hiring, promotion, and compensation. Both of these theories have been widely studied and debated in the economic literature on labor market discrimination.

2.3.1 Labor market segmentation theory

The labor market segmentation theory suggests that the labor market is divided into distinct segments, each characterized by different wages, working conditions, and employment benefits. According to this theory, these segments are not necessarily determined by individual characteristics, such as education and skills, but are shaped by broader social, economic, and political factors. Studies in the literature have provided empirical support for the existence of labor market segmentation. Doeringer and Piore (1975) conducted research on the American labor market, which is divided into a primary and secondary sector. The primary sector is characterized by higher salaries, stability, and better working conditions, while the secondary sector is characterized by lower salaries, instability, and poorer working conditions. Doeringer's research found that workers in the secondary sector are disproportionately from marginalized groups, suggesting that broader social and economic factors contribute to labor market segmentation.

2.3.2 Taste based and statistical discrimination

Ashenfelter and Oaxaca (1987) defines market discrimination as the comparison of wage rate of two groups F (for Formal employment) and I (for Informal employment) as:

- i As they are actually observed
- ii As they would be observed in absence of discrimination

F and I would have same wage rate in the market in the absence of discrimination if they are perfect substitute in production. Here, difference in the wage rate between F and I would be the measure of discrimination.

If the observed wages of F and I are π_f and π_i , and if no discrimination exists wage would be π_{fo} and π_{io} . In such situation, proportion wage discrimination

against I is

$$\frac{\left(\frac{\pi_f}{\pi_i} - \frac{\pi_{fo}}{\pi_{io}}\right)}{\left(\frac{\pi_{fo}}{\pi_{io}}\right)} \approx \ln\left(\frac{\pi_f}{\pi_i}\right) - \ln\left(\frac{\pi_{fo}}{\pi_{io}}\right) \quad (2.1)$$

Where D is the proportionate fall in the I to the F wage ratio, for the case of absence of discrimination. Let us assume, some characteristics X determine pay in the absence of discrimination. For group F, relation between wage π_f and these characteristics is of the form

$$\ln \pi_f = \beta_f X + \mu \quad (2.2)$$

where β_f is unknown regression coefficients market wage discrimination is μ is disturbance coefficient. The proportionate market wage discrimination is

$$D \approx \ln\left(\frac{\pi_f}{\pi_i}\right) - \beta_f (X_f - X_i) \quad (2.3)$$

where X_f and X_i represent the characteristics of F and I, respectively. Here, discrimination is measured as the difference between $\beta_f X_f$ and the proportionate wage difference if F were paid in the same way as I.

2.4 Empirical reviews

A considerable number of studies have been done on informal economic activities, origin and development of informal employment and subsequent wage discrimination in the labour market. First, literature concerning the labour market position of informal employment is analysed. Next, the literature on labour market discrimination will be reviewed.

2.4.1 Labor market position of informal employment

According to traditional human capital theory, earnings and, consequently, poverty are mostly determined by education and training, which explains why these factors are important in determining policy. Kahyalar et al. (2018) is of the idea that economists have looked at the wage difference between the formal and informal sectors in an effort to determine whether informal workers make less money than their formal counterparts. According to the classic labor theory, employees choose for the informal economy because entrance restrictions keep them out of the formal one (e.g. labour market regulations). As a result, workers accept lower-paying occupations in the informal sector. Working in the informal sector reflects the worker's own decision, which is based on the benefits and drawbacks connected with each sector, claims the competitive labor market theory (Henley

et al., 2009). Under this framework, the wage gap tends to disappear.

In attempt to identify the fundamental economic and social factors that are connected to greater levels of informal work, C. C. Williams and Horodnic (2019) presents the varying prevalence of informal employment around the world. Bivariate regressions are used in the study to evaluate the ILO database on the prevalence of informal employment in 112 countries based on macroeconomic and social circumstances. According to the study, there is an association between higher rates of informal employment and lower levels of economic underdevelopment, public sector corruption, and state intervention to protect employees from poverty. The level of development, corruption, tax rates, the size of the government, the amount of social contributions, and the percentage of poverty are all factors that influence the share of informal employment between countries.

Yamamoto et al. (2019) looks into how education level affects men and women's career choices in urban and rural settings. The results demonstrates that, in comparison to men and urban women, women in rural areas have more difficulties finding steady employment even when their degree of educational attainment is controlled. Additionally, our decomposition results demonstrate that regular female workers in rural areas have a significant wage disparity as a result of the effects of gender discrimination. These findings suggest that, despite having high levels of education comparable to those of men or urban women, rural women face considerable wage discrimination and fewer opportunities to secure steady employment.

The impact of education and experience level on the wage structure in Nepal's formal, unofficial, and agricultural sectors is examined by Adhikari et al. (2019). By using the Nepal Labor Force Survey -II data, the Mincerion wage equation and quantile regression technique have been employed to examine such an impact. Results indicate that in all three sectors, wage returns are positively correlated with education. Return to experience, however, is associated negatively with the agricultural industry. Additionally, the impact of returning to school is greater at higher quantiles along with the wage distribution between the formal and informal sectors. In the formal sector, education has a maximum impact of 4% at the 0.90 quantile.

A human capital model that uses Heckman's two-step technique to compensate for selectivity bias estimates a considerable formal informal wage gap for Bolivia in Monsted (2020)'s study. Then, using a Mincerian specification, wages were estimated, and it was discovered that there were some discrepancies between the formal and informal labor markets. While job-specific experience did not show the typical hump shape for these people, returns to education are often higher for

those employed in the formal sector. Instead, wages are linearly related to experience in the current position, suggesting that longevity is more significant than productivity.

Kahyalar et al. (2018) investigates the wage difference between formal and informal sector in the case of Turkish labour market using OLS regression and the Oaxaca- Ransom decomposition method. The results derived from the techniques indicates a wage gap in favour of formal sector workers and that the wage gap was found to be higher at the higher end of informality.

C. Williams and Gashi (2021) used 8533 household interview surveys in 2017 to break out the wage gap between official and informal work in Kosovo from a gender viewpoint. The net hourly salary that employees report is the dependent variable used in this paper. Informal workers are individuals who claim to be employed without a contract and who are not disclosed to the authorities in charge of tax and pension contributions. Three significant findings may be seen by looking at the descriptive data on the net salary rates of men and women in formal and informal work. First off, people in formal employment make an hourly average net salary of €2.50 as opposed to €1.40 for those in informal employment. Second, formal employment pays higher net wages to both men and women than does informal employment. Third, while women are paid 7.1 percent more than men in informal employment (€1.50 compared to €1.40), men are paid 4% more than women in formal employment. The end result is that, when working in both the formal and informal economies is considered, women earn a net hourly pay that is 9.5% greater than that of men (€2.30 against €2.10).

The wage gap was explored at the mean using OLS regression by R. L. Oaxaca and Ransom (1994) in decomposition method-with and without sample selection- in the study in Turkey on the wage difference between the formal and the informal sector. The results of this technique show that there is a wage disparity in favor of those employed in the formal sector, and that the salary gap was greater when the informality definition was at its upper bound. The findings show there is a wage gap along the wage distribution that favors workers in the formal sector. The findings show there is a wage gap along the wage distribution that favors workers in the formal sector.

2.5 Review of national studies

The wage differences between formal and informal work in Nepal have not been extensively studied. The gender wage gap in Nepal's urban and rural labor markets was studied by Yamamoto et al. (2019). The estimation results revealed that due to the unexplained effects, rural females experience disadvantages in both job opportunities and wage payments. Even those with greater degrees have

trouble finding jobs for urban women. The Oaxaca-Blinder estimation finding implies that the impacts of discrimination vary depending on job level and the geographic areas attributed to regional variations in industrial structures. While the majority of men and women work in the agriculture sector in rural areas, most females work in agriculture area and males in informal employment.

Parajuli (2014) analyzes the determinants of informal employment in Nepal and significance of education attainment on wage discrimination status among formal and informal sectors excluding agriculture in Nepal. He used the informality information from NLFS II data set produced by ILO ; a national level representative household surveys regarding information on formal and informal employment information. The significance of education, age, gender, marital status, occupation urban and rural workers on hourly wage of workers in informal sector has been observed. In the study, a simple Probit regression model is estimated using MLE method to capture and analyze probability of participating informal employment instead of formal one with stated characteristics. The studies finds out individual being in Janajati and Dalit as ethnic group are likely to participate 1.14 and 1.10 times more in informal employment in reference to Bramhan. Similarly, being a male worker is associated 1.53 times more probability of being employed informally and an individual residing in urban sector has 1.17 times higher probability to work in informal sector than a person living in rural areas. To improve cross-country comparability, the figures are based on the most recent national labor force surveys or household surveys that follow a standard definition of informal work. The significance of the three explanations for the higher levels of informal employment—economic underdevelopment and corruption (modernization theory), excessive government involvement (neo-liberal theory), and insufficient government protection of workers from poverty (political economy theory)—is examined. According to the study, lower informal employment is linked to state action in the form of higher tax rates and social transfers to shield employees from poverty and development. In Nepal, 94.3 percent of the workforce has an informal job as their primary source of income, and 90.7 percent of those people operate in the informal economy.

By incorporating occupational and firm size effects into the Oaxaca method, Jafarey et al. (2014) examines the caste wage disparities in Nepal. The study looked at the 2003 and 2010 surveys of the Nepali labor force. Along with disparities in human capital endowments, occupational and company size influences on explaining inequality, caste wage disparity is found in the Nepalese labor market. The outcome of the discriminatory components shows that for both Matwali and Pani-Nachalne groups, access disparities persist despite variations in human cap-

ital. This shows that discriminatory practices by employers still exist in Nepal, as does a lack of networks to help individuals of low caste groups get employment in higher paying companies.

2.6 Research gap

In Nepal, study has been done regarding the size of informal economy using Currency Demand Approach (Raut et al., 2014), significance of education and experience on wage distribution using quantile regression approach (Adhikari et al., 2019), gender based differences in wage distribution and employment opportunities employing Oaxaca–Blinder decomposition using NLFS II data (Yamamoto et al., 2019), determinants of informal employment and wage gap differential using probit regression model (Parajuli, 2014), but as per the knowledge of the researcher, this is the first study being incorporated on the determinants of wage gap differentials between formal and informal employment in Nepal using Oaxaca-blinder by using most recent dataset (NLFS III) with more predictors to explain the wage of formal and informal employment. We also classify the wage decomposition based on human capital, employer and job related characteristics.

CHAPTER III

RESEARCH METHODOLOGY

This chapter explains the theoretical and conceptual framework of the study. The model discusses about the Mincerian wage function and Oaxaca-Blinder decomposition approach to examine the inequality in wage payment across employment. To execute the empirical strategy, the subsequent subsections discuss about the sources of data and variables used in the study.

3.1 Philosophical issues

This study is based on the radical structuralism paradigm, which posits that an individual's labor force participation is determined by factors such as their human capital. As a part of economics research, the aim of this study is to generate true and positive knowledge about reality through objective and value-free methods. The epistemological stance of this study is positivist, meaning it relies on empirical methods and data to construct and evaluate theories about labor discrimination. The researcher will strive to remain unbiased and neutral throughout the study, in line with the axiological position of conducting the study in a value-free manner. The study's philosophical foundation is rooted in the Neo-classical framework.

3.2 Theoretical framework

The present study aims to analyze the wage differential between formal and informal employment in Nepal, with a focus on the net hourly earnings of men and women in these two sectors. In order to achieve this goal, we will utilize the Blinder-Oaxaca decomposition method, which is a commonly used statistical technique for analyzing differences in labor market outcomes between different groups, such as by gender and age. The formal employment in Nepal (non-agriculture) includes those employed in government or state-owned enterprises, international organizations/foreign embassies, and incorporated companies or establishments that are registered with relevant authorities. The informal employment (non-agriculture) comprises those employed in enterprises that are neither incorporated nor registered with authorities, as well as those employed in private households.

The Blinder-Oaxaca decomposition method allows us to explain the difference

in the means of a dependent variable (in this case, net hourly earnings) between two groups (formal and informal employment) by decomposing the gap into that part which is due to differences in the mean values of the independent variables within the groups, and group differences in the effects of the independent variables (Blinder, 1973; R. Oaxaca, 1973). In other words, it allows us to examine the extent to which differences in net hourly earnings between formal and informal employment can be attributed to differences in individual characteristics (such as education level and work experience) and group-level factors (such as industry and job type). By using this methodology, we will be able to provide a more nuanced understanding of the wage differential between formal and informal employment in Nepal. This will help to inform policy and practice related to improving working conditions and increasing wages for workers in informal employment in Nepal.

3.2.1 Mincerian wage equation

The Mincerian wage equation is a theoretical model used to describe the relationship between an individual's wage rate and their human capital characteristics (e.g., education, experience, and training). The empirical version of the Mincerian wage equation is often used to estimate the returns to human capital using data from actual wage observations.

The Mincerian wage equation is typically specified as follows

$$\ln(\text{Wage}) = \beta_0 + \beta_1 \cdot \text{Education} + \beta_2 \cdot \text{Experience} + \beta_3 \cdot \text{Experience}^2 + \epsilon \quad (3.1)$$

In this equation, 'Wage' is the dependent variable representing the individual's wage rate, 'Education' is a measure of the individual's education level (e.g., years of schooling), 'Experience' is a measure of the individual's work experience (e.g., years on the job), and 'Experience squared' is the square of the experience term. The coefficients ' β_0 ', ' β_1 ', ' β_2 ', and ' β_3 ' are the parameters to be estimated, and ' ϵ ' is the error term.

One of the key insights of the Mincerian wage equation is that human capital investments have a positive and significant impact on wage rates. This relationship has been consistently found in a variety of empirical studies using data from different countries and time periods. However, the precise magnitude of the effect of human capital on wages has varied across studies. Some research has found that education has a larger impact on wages than experience, while other studies have found the opposite. The effect of specific types of education (e.g., college versus high school) and experience (e.g., on-the-job versus off-the-job) has also been an active area of research. In addition to these core human capital variables, other factors that have been found to influence wages include gender, race, and industry

of employment. For example, studies have consistently found that women and minority groups tend to have lower wages than men and majority groups, even when controlling for human capital characteristics.

3.2.2 Sample selection bias

Sample selection bias can occur in labor market literature when researchers only study a particular group of workers, such as those who are employed or those who are unemployed, and use this sample to draw conclusions about the entire labor market. This can lead to biased estimates of key labor market outcomes, such as wages, employment rates, and job satisfaction. The main problem in measuring the wage gap between the formal and the informal employment is trying to answer the following counterfactual question: ‘What happens if the allocation of individuals to the informal employment and the formal employment are not random?’ A participation decision of workers to participate in any sector (endogenous selection) brings selectivity bias to occur and affects the formal–informal wage gap. To implement this procedure, a probit regression is run in the first stage to find the probability of working in the informal sector as a function of original variables and an additional identifying variable.

This then leads to a practical difficulty in finding excluded variables for regression analysis. As mentioned above, workers may not be a random sample of working-age population. Unobserved factors may determine workers’ sectoral choice. We aim to solve the problem, sample selection, by introducing a correction term obtained from a probit model into the wage equation. Using the available data, we expect the proportion of the informal sector to all workers to influence the sectoral choice of workers without having a (direct) impact on wages.

3.3 OLS regression and the Oaxaca-Blinder decomposition

The analysis is based on a Mincerian earnings function, which is modelled by Blinder (1973) and R. Oaxaca (1973) and includes experience (as a proxy for the job training), its square, education and other variables that are associated with individuals’ earnings. This model is specified for the formal and the informal sector as follows:

$$\ln w_i^{FE} = x_i^{FE} \beta + \epsilon_i^{FE} \quad (3.2)$$

$$\ln w_i^{IE} = x_i^{IE} \beta + \epsilon_i^{IE} \quad (3.3)$$

where $i = \{1, \dots, N\}$ denotes individuals and $\ln w_i^{FE}$ and $\ln w_i^{IE}$ refer to the log of the hourly wage of the individual i in the formal and the informal sectors, respectively. x_i^{FE} and x_i^{IE} represent individual characteristics such as education,

experience, gender, location, etc. The estimated earning equations for formal and informal workers, $\ln w_i^{FE} = x_i^{FE}\beta + \epsilon_i^{FE}$ and $\ln w_i^{IE} = x_i^{IE}\beta + \epsilon_i^{IE}$, are used to calculate the difference in wages between the formal sector and the informal sector.

First, taking the gross wage differential (denoted as w) between the Formal employment (FE) and the informal employment (IE) groups is the difference in the predicted logarithmic daily wages of the two groups (the higher wage group: FE; and the lower wage group: IE)

$$W = E(Y_{FE}) - E(Y_{IE}) \quad (3.4)$$

where $E(Y)$ denotes the expected value of the outcome variable, is accounted for by group differences in the predictors.

Based on the linear model where X is a vector containing the predictors and a constant, β contains the slope parameters and the intercept, and ϵ_i is the error, the mean outcome difference can be expressed as the difference in the linear prediction at the group-specific means of the regressors. That is,

$$W = E(Y_{FE}) - E(Y_{IE}) = (E(X_{FE}))'\beta_{FE} - (E(X_{IE}))'\beta_{IE} \quad (3.5)$$

because

$$E(Y_i) = E(X_i'\beta_i + \epsilon_i) = E(X_i'\beta_i) + E(\epsilon_i) = E(X_i'\beta_i) \quad (3.6)$$

where $E(\beta_i) = \beta_i$ and $E(\epsilon_i) = 0$ by assumption.

To identify the contribution of group differences in predictors to the overall outcome difference, equation 3.6 can be rearranged, for example, as follows:

$$W = (E(X_{FE}) - E(X_{IE}))'\beta_{IE} + (E(X_{IE}))'(\beta_{FE} - \beta_{IE}) \quad (3.7)$$

$$+ (E(X_{FE}) - E(X_{IE}))'(\beta_{FE} - \beta_{IE}) \quad (3.8)$$

This is a “threefold” decomposition; that is, the outcome difference is divided into three components:

$$W = E + C + I \quad (3.9)$$

The first component in equation 3.9, $E = (E(X_{FE}) - E(X_{IE}))'\beta_{IE}$ amounts to the part of the differential that is due to group differences in the predictors (the “endowments effect”).

The second component in equation 3.9 on the preceding page,

$C = (E(X_{IE}))'(\beta_{FE} - \beta_{IE})$ measures the contribution of differences in the coefficients (including differences in the intercept).

The third component in equation 3.9 on the previous page,

$I = (E(X_{FE}) - E(X_{IE}))'(\beta_{FE} - \beta_{IE})$ is an interaction term accounting for the fact that differences in endowments and coefficients exist simultaneously between the two groups.

The decomposition shown in equation 3.8 on the preceding page is formulated from the viewpoint of group IE. That is, the group differences in the predictors are weighted by the coefficients of group IE to determine the endowments effect (E). The E component measures the expected change in group IE's mean outcome if group IE had group FE's predictor levels. Similarly, for the C component (the "coefficients effect"), the differences in coefficients are weighted by group IE's predictor levels. That is, the C component measures the expected change in group IE's mean outcome if group IE had group FE's coefficients.

3.4 Conceptual framework

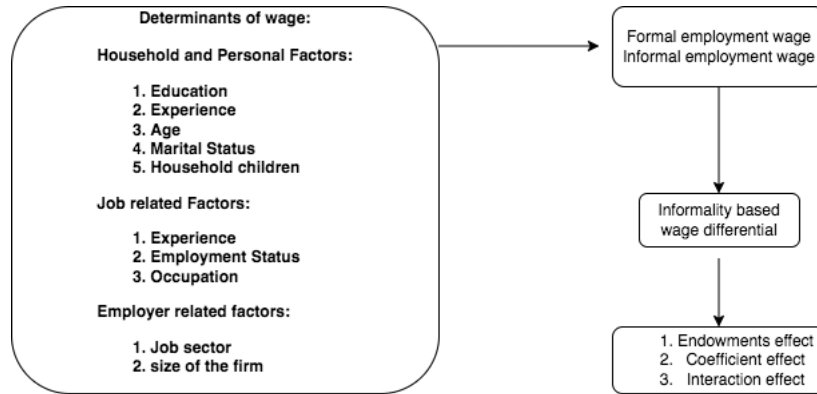


Figure 3.1: Conceptual framework

In the figure 3.1, the determinants of the wage earnings for formal and informal employments are categorized as household and personal characteristics, job related characteristics and employer characteristics. These variables leads to the contribution of the wage differences with each variables contributing differently for the wage earnings as shown on subsequent chapter. The informality based wage differential can further be analyzed as endowments, coefficient and interaction effect as shown in table 4.12 on page 37

3.5 Data

This study usages nationally representative labor force surveys conducted in 2017 referred as Nepal Labor Force Survey- third round (NLFS -III). Central

Bureau of Statistics (CBS) of Nepal administers the survey following the standard methodology and sampling design suggested by World Bank's living standard measurement survey framework. Using a multi-stage clustering sampling approach, this survey collects rich information about individual labor pertaining to various labor related indicators. Nepal Labor Force Survey (2017/18) data produced by the Central Bureau of Statistics has been used for the analysis. The survey used the 2011 National Population and Housing Census as a frame and included both rural and urban areas across seven provinces, resulting in a total of 14 domains. The frame consisted of 40,064 enumeration areas, which served as primary sampling units and were stratified into three replicates. A systematic sample of 20 households per unit was selected, yielding a total of 18,000 households and 77,638 individual data points. For the purposes of this study, the sample was restricted to wage earners aged 15 or older who had worked for pay within the past week. This resulted in a sample size of 8,743 individuals, with 1153 formal and 7590 informal employment participants.

Our earnings measure is daily wage. The wage earner criteria reduce the observations from 77,638 to 8743. Our decomposition analysis is restricted to individuals of 15-60 years who are in full time wage employment defined as individuals who work for 40 hours or more during the week satisfying the following criteria: (a) work in private financial business firm, private non-financial institutions, non-profit institutions and other institutions. Those who work in government, state-owned enterprises and international organizations/foreign embassy are excluded (b) mode of payment is cash.

3.6 Dependent and independent variable

The dependent variable used in this paper is the net log hourly wage reported by employees. Hourly wages is computed by dividing monthly wages by the total hours of work per month. The survey collected information on the usual hours work per week but not the number of weeks worked during a month. Therefore, the monthly hours of work is computed by multiplying the usual hours of work per week to 4.

To control for other variables that determine wage levels, three groups of explanatory variables are included in the model: personal and household characteristics, job characteristics and employer characteristics.

Table 3.1: Dependent and independent variables

Variables	Description
Dependent variable	
Hourly wage	Log of hourly wage
Independent variable	
Personal and household characteristics	
Gender	Gender of the respondent; Male = 0 and Female = 1
Experience	Experience is calculated as: age – years of schooling – 6
Experience squared	Square of experience
Education	Categories of education is based upon the levels completed Illiterate=1, Below primary = 1, primary = 2 Tenth grade = 3, Secondary = 4, Bachelor = 5 Masters and above =6
Caste Group	Caste of sample is divided into six categories as below: Khas =0, Janajati=1, Adhibasi = 2 Madhesi=3, Dalit = 4, Others = 5
Married Status	Married = 1, Unmarried = 0
Job characteristics	
Occupation	It is classified as per NSCO code Elementary Occupation = 0, Plant Operator = 1, Agriculture, Craft and Trades = 2, Clerical, Service and Sales = 3, Managers and Professionals = 4
Vocational Training	Workers who received vocational training = 1, who did not = 0
Migration for work	Migrated for work = 1, Not migrated for work = 0
Overtime	working hour > 40 hours per week = 1, working hour <40 hours per week = 0
Total chores	Number of hours spent per day in household activities
Employer characteristics	
Firm Size	Small size firm (< 5)=0, Medium size firm (5 to 20)=1 Large size firm (>20)=2
Job Sector	Division of job as per the economic sectors: Agriculture=0, Mining and Quarrying; Electricity,gas supply =1, Construction=2, Manufacturing=3, Market Service=4, Non-market service = 5, Others=6

CHAPTER IV

RESULTS AND DISCUSSION

In this section, we present the result of our descriptive statistics, result of basic regression analysis and Oaxaca-blinder wage gap decomposition.

4.1 Descriptive Statistics

As per our data in table 4.1, the proportion of employees in formal employment increases with the increase in the educational attainment level. Table 4.1 shows that the highest proportion of employees of our sample data for formal employment are of bachelor level at 22% and for informal employment are of Primary level with 27.4%. Employees of primary level of education and below constitutes of 67.10% of total employees in informal employment. Employees of bachelors and above makes for 37.80% of formal employment. There appears an inverse relationship of education among formal and informal employment, where lower attainment of education pushes labor force towards informal employment on average and subsequently formal employment as the education level increases.

Table 4.1: Composition of formal and informal employment by education attainment level

	formal employment	Informal employment	Pooled
Illiterate	4.50%	22.70%	20.30%
Below primary	3.70%	17.00%	15.20%
Primary	11.10%	27.40%	25.20%
Up to tenth grade	20.90%	14.60%	15.50%
Secondary	21.90%	10.20%	11.80%
Bachelors	22.00%	5.80%	7.90%
Masters & above	15.80%	2.30%	4.10%

Source: Authors computation

As per our data in table 4.2 on the next page, small size of firm have the highest share at 43.80% and medium size firm have lowest at 21.90%, while large size firm composes of 34.30%. However, there has been an uneven distribution of employment on the basis of size of the firm in formal employment, where large size of firm makes for 92.30% of total employment. Small and medium size firm

Table 4.2: Composition of formal and informal employment by the size of the firm

	Formal employment	Informal employment	Pooled
Small size firm	4.60%	49.70%	43.80%
Medium size firm	3.10%	24.70%	21.90%
Large size firm	92.30%	25.50%	34.30%

Source: Authors computation

Table 4.3: Composition of formal and informal employment by the division of job as per the economic sectors

	Formal employment	Informal employment	Pooled
Agriculture	8.00%	13.60%	12.90%
Mining and Quarrying	3.40%	2.90%	3.00%
Construction	1.30%	32.90%	28.70%
Manufacturing	7.20%	13.90%	13.00%
Market Service	20.90%	18.70%	19.00%
Non-market service	57.90%	15.80%	21.30%
Arts, entertainment and other service activities	1.30%	2.20%	2.10%

Source: Authors computation

are visibly lower at 4.60% and 3.10% respectively. This is not a surprise though, considering the fact that the definition of formal and informal employment in this study is based on attainment of job based benefits including temporary leave, leave based benefits, contract of job, social security contributions, sickness, illness and injury based compensations as well as registered to the authority which is legally mandatory by the authority and implemented by the large size firms, whereas medium and small size firm lacks behind on ensuring these benefits. It is interesting to note half of the informal employment at the small size firm, which is evident to the nature of the jobs being carried out in the informal employment in Nepal such as street vendors, domestic workers, construction workers, transportation workers and agriculture workers.

As per the table 4.3.construction sector at 28.70% makes for the highest share of total employment and informal employment. Considering the fact that, there is only 1.30% employment on construction sector formally, and a wage gap of 49.5% ; most among any economic sector, workers on this sector have been subject of economic, work place and safety based vulnerabilities. Non market service makes for 21.30% of total employment, and 57.90% of the formal employment.

As per the table 4.4 on the next page, of our total sample, Khas makes for 30.30% , Janajati at 28.10% , Dalit at 14.60%, Adhibasi at 13.20% , Madhesi at 10.20% and rest . Over half of total employed in formal employment are Khas at 55.00% followed with 24.70% of Janajati, 9.80% for Madesi . Dalit groups appears to have administrative and societal barriers to enter the formal employment with

Table 4.4: Composition of formal and informal employment by the caste group

	Formal employment	Informal employment	Pooled
Khas	55.00%	26.50%	30.30%
Janajati	24.70%	28.60%	28.10%
Adhibasi	5.60%	14.40%	13.30%
Madhesi	9.80%	10.20%	10.20%
Dalit	3.60%	16.40%	14.60%
Others	1.20%	3.90%	3.50%

Source: Authors computation

Table 4.5: Composition of formal and informal employment by the occupation class

	Formal employment	Informal employment	Pooled
Elementary occupation	8.20%	36.60%	32.80%
Plant machine operator and assembler	4.90%	7.70%	7.30%
Skilled agriculture and trade workers	3.20%	30.20%	26.60%
Clerical, service and sales workers	21.80%	11.00%	12.40%
Managers, professional and technicians	61.90%	14.60%	20.80%

Source: Authors computation

only 3.60 % of formal employment being Dalits. Of the total informal employment, Janajati has the highest share at 28.60 %, followed with 26.50% of Khas, 16.40 % Dalit, 14.40% Adhibasi and rest of others.

Table 4.5 shows that elementary occupation makes for 32.80%, followed with skilled agriculture and trade workers at 26.60% and managers, professional and technicians at 20.80% of total employment. Over the formal employment, managers, professional and technicians have the highest share at 61.90% followed with clerical service and sales workers at 21.80%. The trend is completely opposite in informal employment where 36.60% are of elementary occupation, followed with skilled agriculture and trade workers at 30.20% and managers, professionals and technicians at 14.60%.

4.2 Wage differential between formal and informal employment

Figure 4.1 on the next page shows that the earnings distribution is shifting towards the left for informal workers compared to formal workers and shows much greater variation. As per our data from table 4.6 on page 29, employees who are in informal employment and are female, based in urban area, do not have vocational training, have not migrated for work, does overtime work, and have children earn on average less than respective attributes in formal employment. The kernel density curve of figure 4.1 on the next page shows the variations across formal and informal employment.

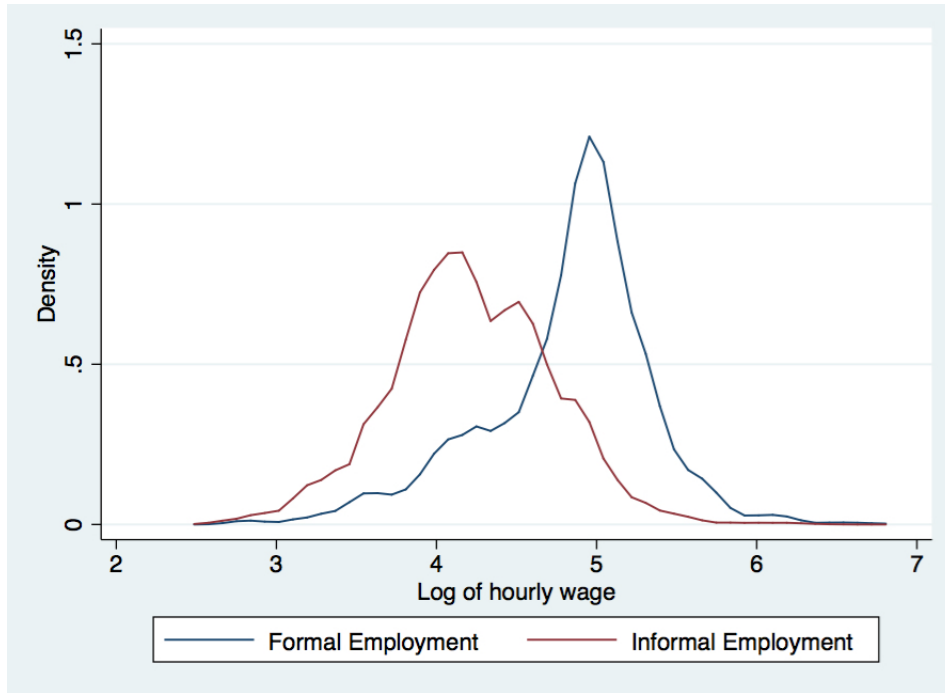


Figure 4.1: Changes in the distribution of log hourly wages, by formal and informal employment

4.3 Factors explaining the wage differential

As per our table 4.6 on page 29, workers who are male, are residing in urban areas, have vocational training and have no children earn more in terms of both formal and informal employment. When we look at the relative percentage gap between these personal characteristics, an employee being a female has highest differential with 52.98% , followed with employees in urban areas at 45.61% and having household childrens. The kernel density curve for all of these characteristics and the differentials across both formal and informal employment is shown in the figure 4.3 on the next page and 4.3 on page 29

As per table 4.7 on page 31, the average real hourly wage rate for both of the formal and informal employment increases with the increase in education level, aligning with the preexisting literature of human capital theory. Illiterate workers on an average earn Rs. 64.07 per hour, the lowest among education level, and masters and above workers earn Rs. 202. 654, the highest among education level for formal employment. Similarly, Illiterate workers on an average earn Rs. 64.01 per hour, the lowest among education level, and masters and above workers earn Rs. 159.09 per hour, the highest among education level for informal employment. Although the increase in education attainment level increases the average real hourly wage rate for all employment, the percentage real gap highly exists across all level. The wage gap is highest for tenth grade at 38.67% and secondary level at 38.34% and starts decreasing for bachelor level at 30.60% and masters and

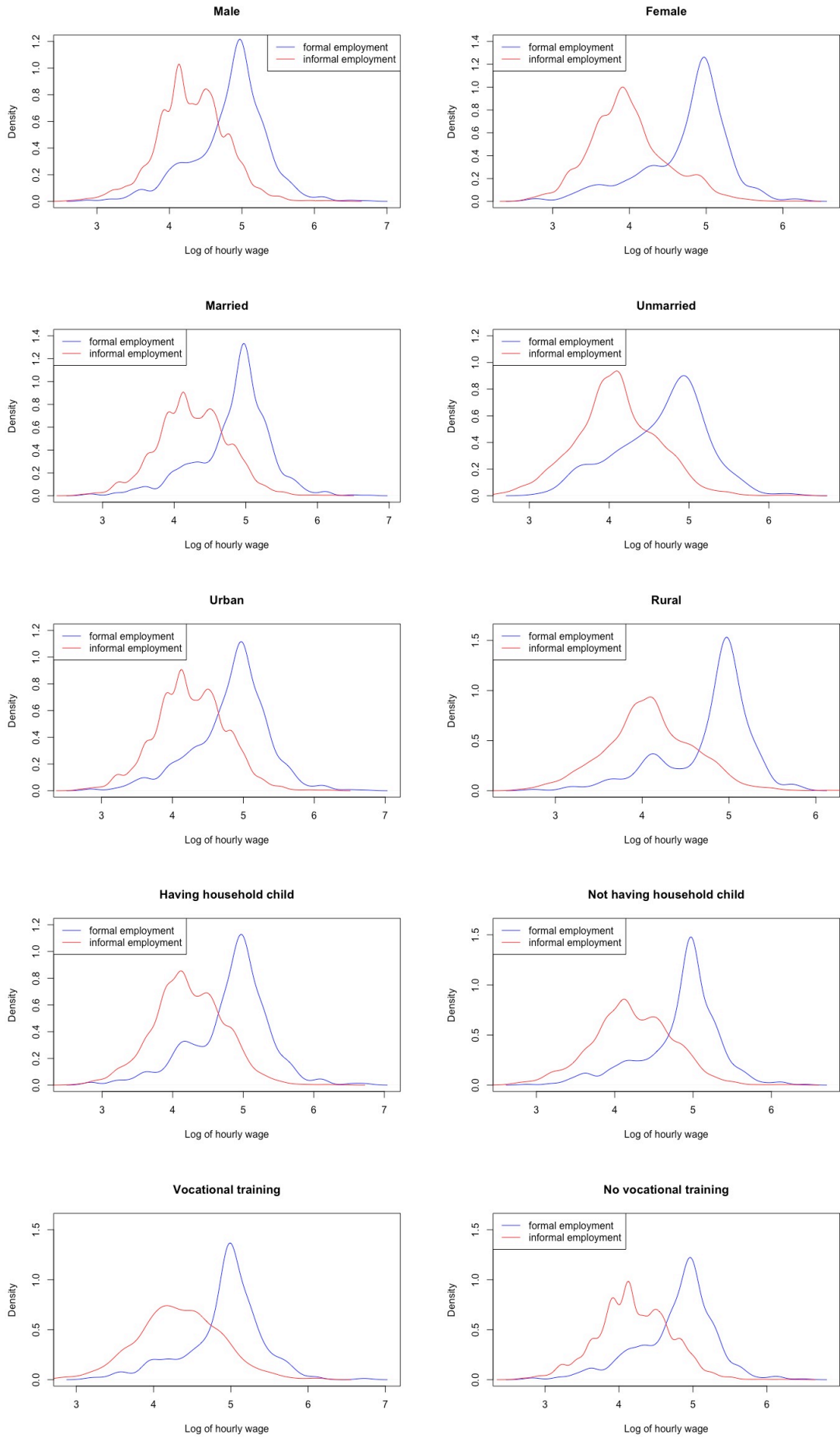


Figure 4.2: Changes in the distribution of log hourly wages, by formal and informal employment across household and individual characteristics

Table 4.6: Average real daily wage rate for formal and informal employment by personal characteristics

	Formal employment	Informal employment	Pooled	PRG
Male	141.42	82.79	90.75	41.46
Female	131.42	61.80	70.22	52.98
Rural	131.09	77.71	82.78	40.72
Urban	141.57	77.00	86.73	45.61
Vocational training	149.64	88.48	102.54	40.87
No vocational training	135.20	75.49	82.32	44.16
Migrated for work	162.78	89.66	107.87	44.92
Not migrated for work	132.16	75.83	82.37	42.62
Overtime	113.04	73.86	77.35	34.66
No overtime	160.38	85.17	101.53	46.89
Children	141.51	78.06	86.38	44.84
No children	142.02	78.30	89.29	44.87

Source: Authors computation

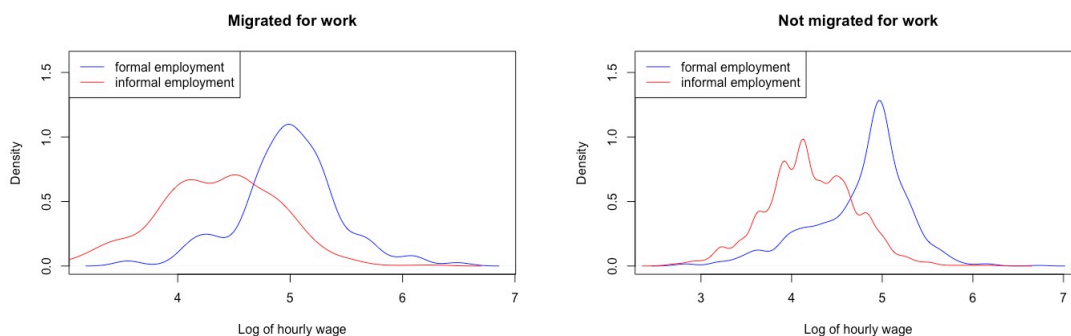


Figure 4.3: Changes in the distribution of log hourly wages, by formal and informal employment across migration

above level at 21.49%. There is not much significant difference of real hourly wage rate for Illiterate and below primary level workers, with the lack of human capital forcing workers to earn the lowest amount. The figure in 4.3 on the following page shows the kernel density curve of log hourly wage for all the education level in formal and informal employment, which supports the preceding conclusion on the existing wage gap.

The average hourly wage rate for formal and informal employment both increases with the increase in the size of the firm, as evident in the table 4.8 on page 31 The average hourly wage rate is highest at Rs. 144.41 for large size firm and lowest at Rs. 74.44 in the formal employment. Although, large size firm have highest earning at Rs. 88.04 and small size firm with lowest earning at Rs. 71.90, this is a significant drop of earning earned in the informal employment over formal

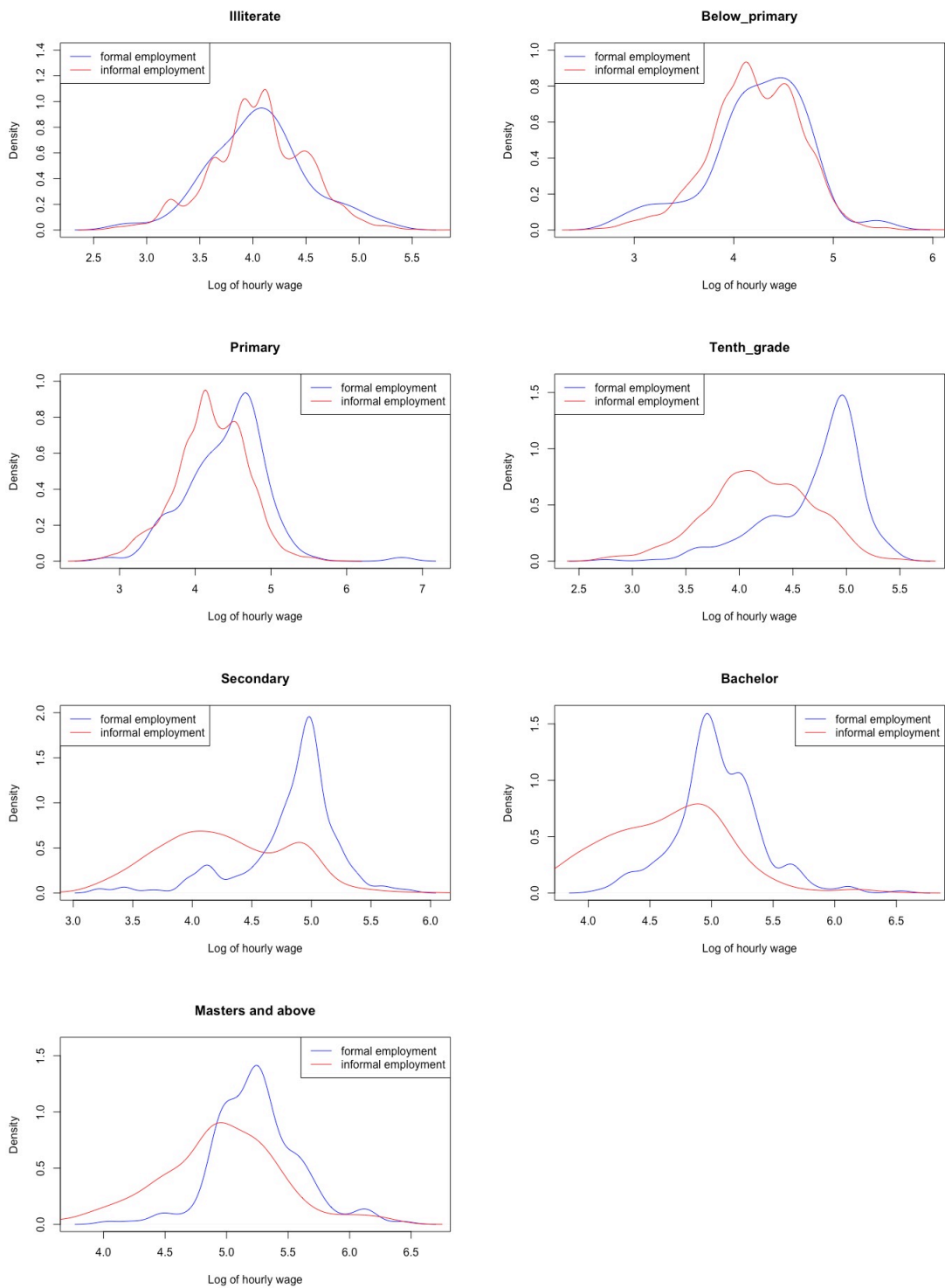


Figure 4.4: Changes in the distribution of log hourly wages, by formal and informal employment across education level

Table 4.7: Average real hourly wage rate for formal and informal employment by education attainment level

	Formal employment	Informal employment	Pooled	PRG
Illiterate	64.07	64.011	64.01	0.09
Below primary	77.93	74.728	74.83	4.11
Primary	89.63	74.544	75.41	16.83
Tenth Grade	120.17	73.69	81.98	38.67
Secondary	134.283	82.796	95.44	38.34
Bachelors	166.662	115.66	134.38	30.60
Masters & above	202.654	159.098	181.17	21.49

Source: Authors computation

Table 4.8: Average real hourly wage rate for formal and informal employment by size of the firm

	Formal employment	Informal employment	PRG
Small size firm	74.44	71.90	3.41
Medium size firm	96.85	76.85	20.65
Large size firm	144.41	88.04	39.03

Source: Authors computation

employment. The increase in the size of the firm also results in the increase of average wage gap as seen from the table 4.8, where a minimal gap of 3.41 % exists in small size firm and staggering 39.03 % in large size firm, which highlights the essence of formalization of informal employment to formal employment. The figure in 4.3 on the next page shows the kernel density curve of log hourly wage for size of the firm in formal and informal employment.

All of the economic sectors have high degree of wage gap as seen on table 4.9 on the following page. Market service has 48.48% wage gap, Mining and Quarrying; Electricity, gas and water supply at 47.41% , Arts and entertainment and other service activities at 47.55% . The lowest wage gap is at 28.89% for manufacturing sector and that itself reflects the precarious situation among formal and informal employment within the division of the job as per the economic sectors. Despite having the highest average wage earned among any economic sectors within informal employment at Rs. 91.56 and second highest average wage earned within formal employment at Rs. 149.59, there exists 38.79% of wage gap in the non-market service as seen in table 4.9 on the next page. The figure in 4.3 on page 33 shows the kernel density curve of log hourly wage for economic job sectors in formal and informal employment. There is a policy discourse on the formalization of jobs according to economic sectors, in which each sector should be studied separately based on its socio-economic significance in the Nepalese labor market.

As per table 4.10 on page 34, Khas group earns the highest average hourly

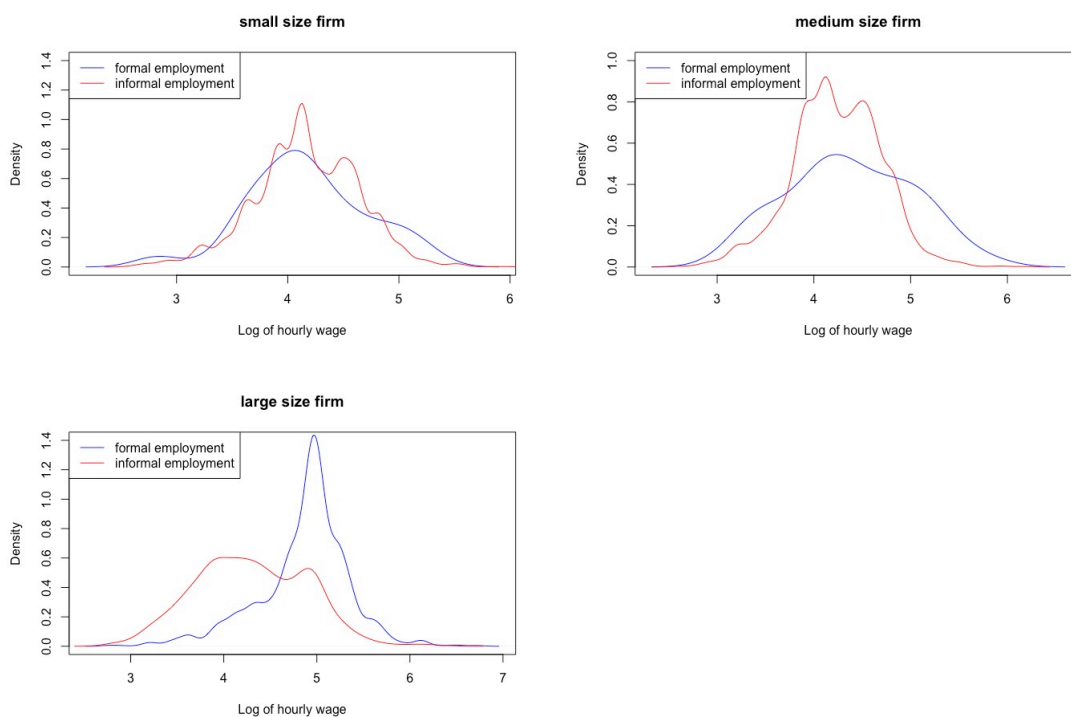


Figure 4.5: Changes in the distribution of log hourly wages, by formal and informal employment across size of the firm

Table 4.9: Average real daily wage rate for formal and informal employment by the division of job as per the economic sectors

	Formal employment	Informal employment	Pooled	PRG
Agriculture	74.34	52.02	53.85	30.02
Electricity and gas supply	136.48	71.77	81.48	47.41
Construction	167.36	84.52	85.02	49.5
Manufacturing	102.59	72.95	75.12	28.89
Market Service	145.17	74.79	85.01	48.48
Non-market service	149.59	91.56	112.33	38.79
Arts and entertainment	146.71	76.95	82.74	47.55

Source: Authors computation

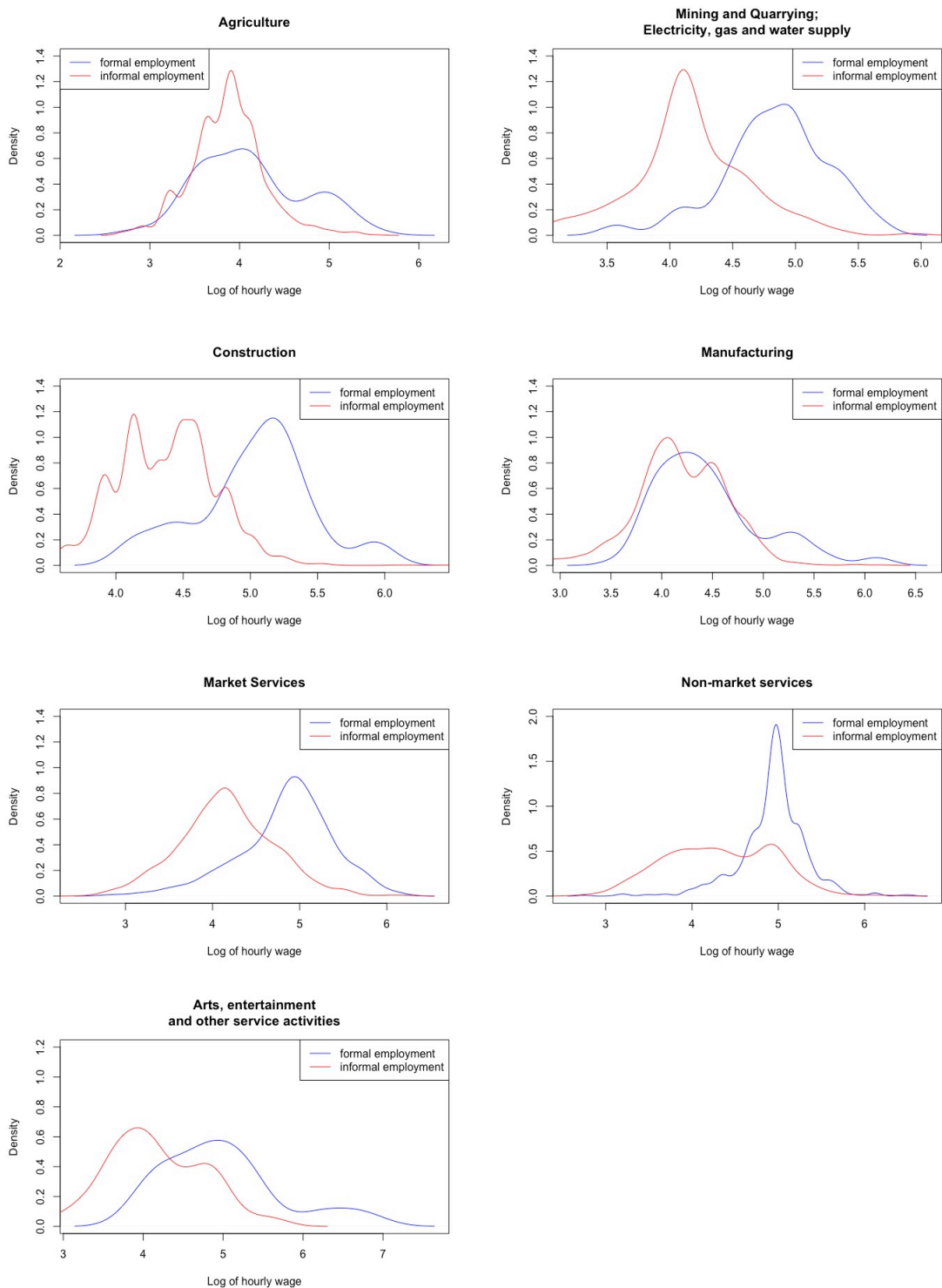


Figure 4.6: Changes in the distribution of log hourly wages, by formal and informal employment across economic sectors

Table 4.10: Average real daily wage rate for formal and informal employment by the caste group

	Formal employment	Informal employment	Pooled	PRG
Khas	150.83	87.94	102.99	41.70
Janajati	133.48	80.01	86.22	40.06
Adhibasi	103.62	66.36	68.45	35.96
Madhesi	121.4	72.31	78.55	40.44
Dalit	99.42	70.21	71.17	29.38
Others	143.14	66.92	70.39	53.25

Source: Authors computation

wage in both formal and informal employment at Rs. 150.83 and Rs. 87.94 respectively, and subsequently highest wage gap exists among any caste group at 41.70% if we ignore the ambiguity of others caste group. There is a clear pattern here among the average hourly wage earning on caste group for formal and informal employment, as well as the existence of the wage gap too, with Khas group followed by Janajati and Madhesi. The average hourly wage for Janajati is Rs. 133.48 and Rs. 80.01 for formal and informal employment respectively and there exists wage gap of 40.06 %. Similarly, the average hourly wage for Madhesi is Rs. 121.4 and Rs. 72.31 for formal and informal employment respectively with a wage gap of 40.44 % . Dalit group have the lowest of average hourly wage rate earnings across both formal and informal employment at Rs. 99.42 and Rs. 70.21 respectively with an existence of 29.38 % wage gap; lowest among any caste group. The figure in 4.3 on the following page shows the kernel density curve of log hourly wage for different caste group in formal and informal employment.

Skilled agriculture and trade workers despite having second highest share of total employment makes for only 3.20% of formal employment, and has the only negative wage gap, where workers in informal employment earns 8.06% more than formal employment. This is do more with the lack of formalization of skilled agriculture workers and trade workers than highest average earnings over occupation class as seen from table 4.11 on the next page. Clerical, service and sales workers have the highest wage gap at 38.23 % followed with Managers, professionals and technicians having the wage gap of 34.72 % between formal and informal employment. The figure in 4.3 on page 36 shows the kernel density curve of log hourly wage for occupation class in formal and informal employment. Except for manufacturing sector, the distribution of employees across formal employment is skewed from the normal distribution

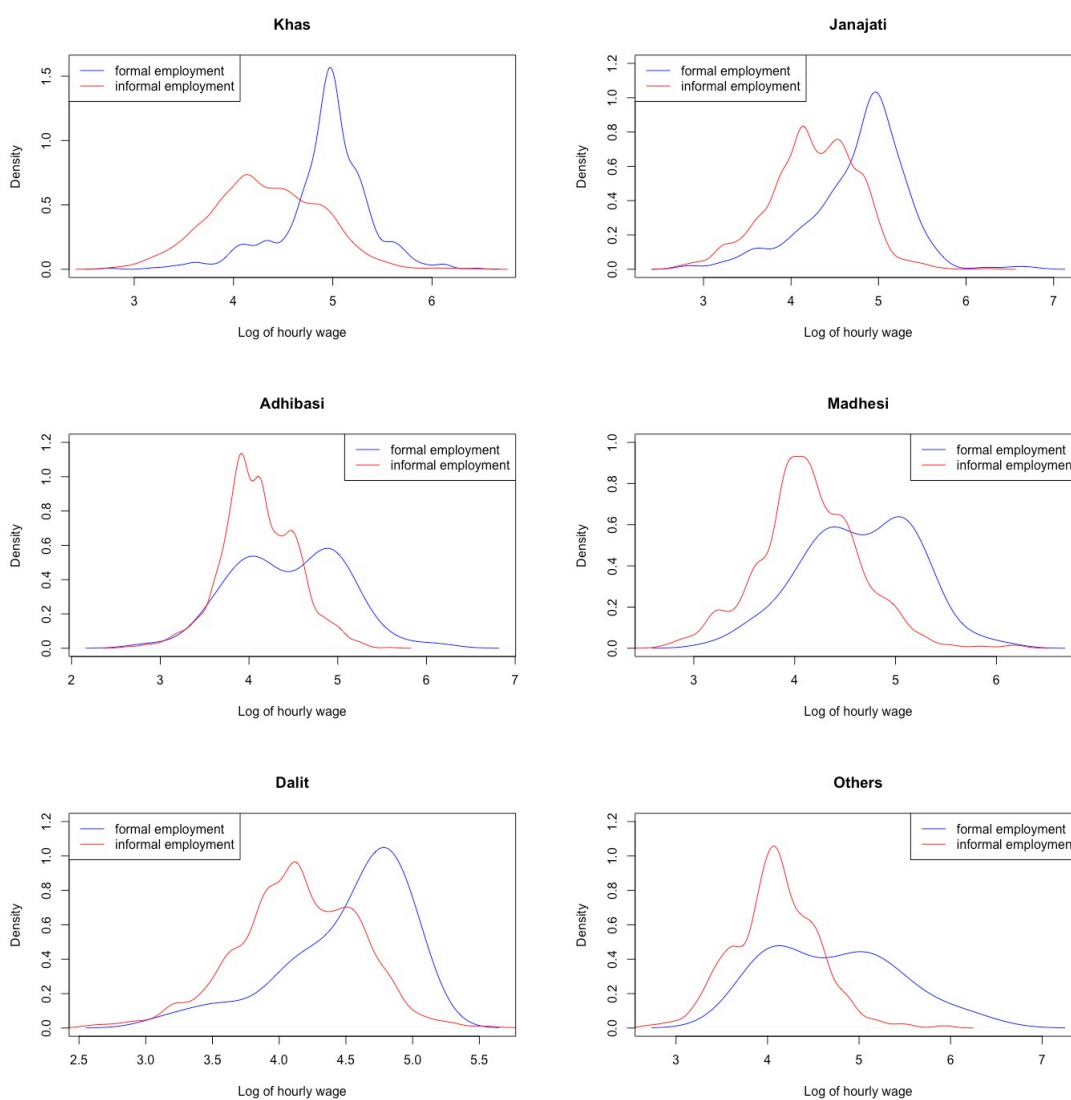


Figure 4.7: Changes in the distribution of log hourly wages, by formal and informal employment across caste group

Table 4.11: Average real daily wage rate for formal and informal employment by the occupation class

	Formal employment	Informal employment	Pooled	PRG
Elementary occupation	76.68	59.76	60.33	22.07
Plant machine operator and assembler	85.2	80.38	80.81	5.66
Skilled agriculture and trade workers	79.3	85.69	85.59	-8.06
Clerical, service and sales workers	115.68	71.45	81.70	38.23
Managers, professional and technicians	162.85	106.31	128.48	34.72

Source: Authors computation

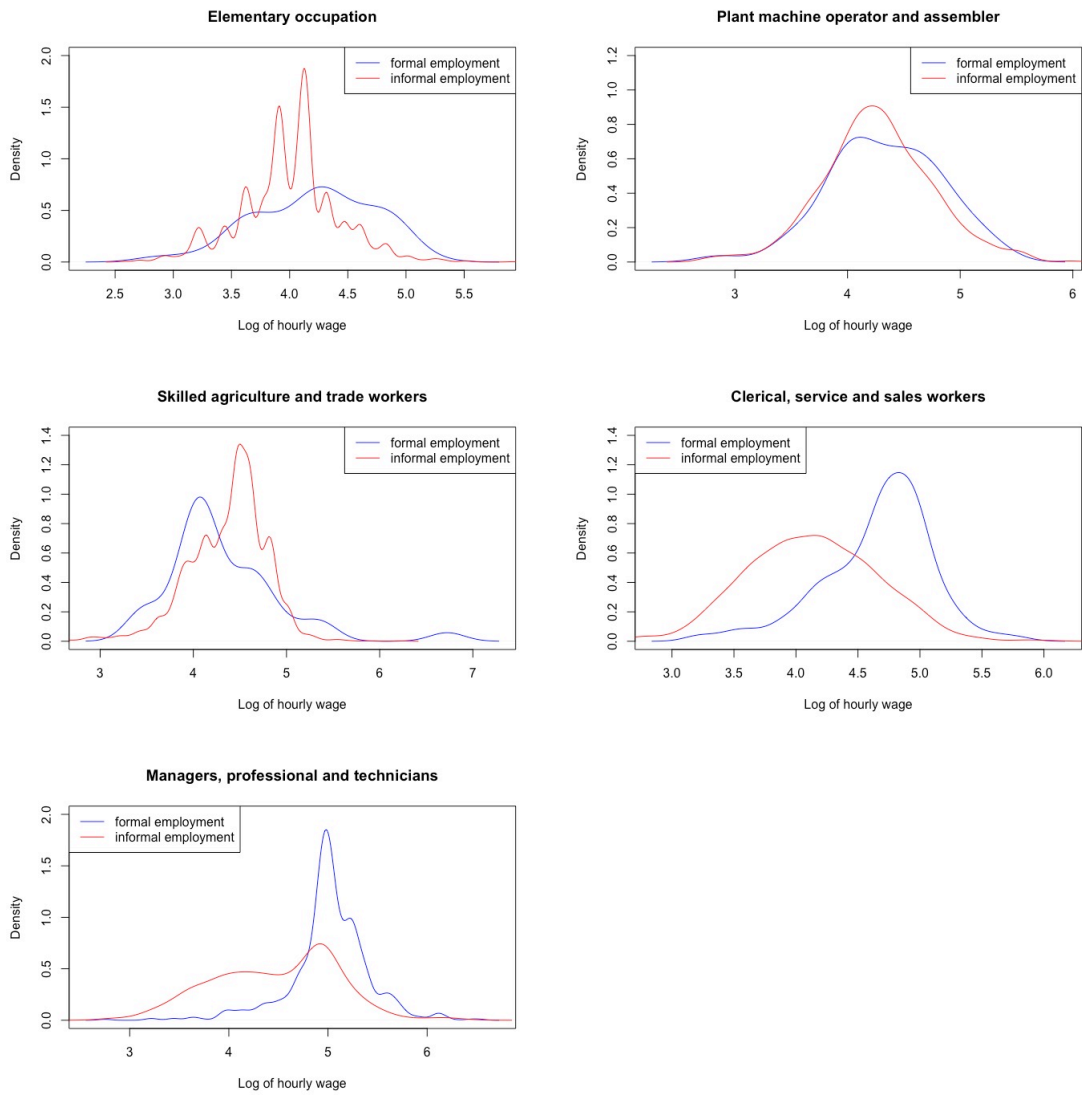


Figure 4.8: Changes in the distribution of log hourly wages, by formal and informal employment across occupation class

Table 4.12: Threefold Blinder-Oaxaca Decomposition in mean wages for formal and informal employment

Average gross hourly wages in Nepalese Rupees (NPR)	
Formal employment	128.81
Informal employment	67.4
difference	0.6476526***
Oaxaca-Blinder effect decomposition	
Endowments (E)	0.3049586***
Coefficients (C)	0.1119687*
Interaction (I)	0.2307253***
Share to total wage gap (%)	
Endowment effect	47.09
Coefficients effect	17.29
Interaction effect	35.62

***, **, * represent significance at 1%, 5% and 10%

Source: Authors computation

4.3.1 Oaxaca- Blinder Decomposition

The overall result of the wage decomposition results by formality in employment for the total sample are presented in the table 4.12:

Group 1 consists of 1153 employees in formal employment while group 2 consists of 7590 employees in informal employment. The mean log hourly wage for the employees in formal employment is 4.86, while the mean log hourly wage for the employees in informal employment is 4.21. **As the overall wage difference presents, employees in informal employment earn about 64.77 percent less than in formal employment do.** This mean wage difference is next decomposed in three parts. The results of this decomposition can be found in the last three rows of table 6.

As the table 7 shows, the **endowment component is 47.09 percent as part of the total difference in the wage gaps.** Nevertheless, **discrimination explains 17.29 percent lower wages and interaction explain about 35.62 percent lower wages for workers in informal employment than that of the workers in formal employment.** **Together the total attributable difference is close to 65 percent (64.38) between the workers in formal and informal employment.**

Table 8 shows the relative contribution of each independent variables on the wage gap. The results in figure 4.9 on the following page shows the total wage gap attributed to difference in endowment, coefficient and interactions. Of the total wage gap, 47.09 percent is attributed to endowment, which is the mean increase in the hourly wage of employees in informal employment if they had the similar characteristics as the employees in formal employment. Similarly, 17.29 percent is attributed to the difference in coefficient, which quantifies the change in wages of

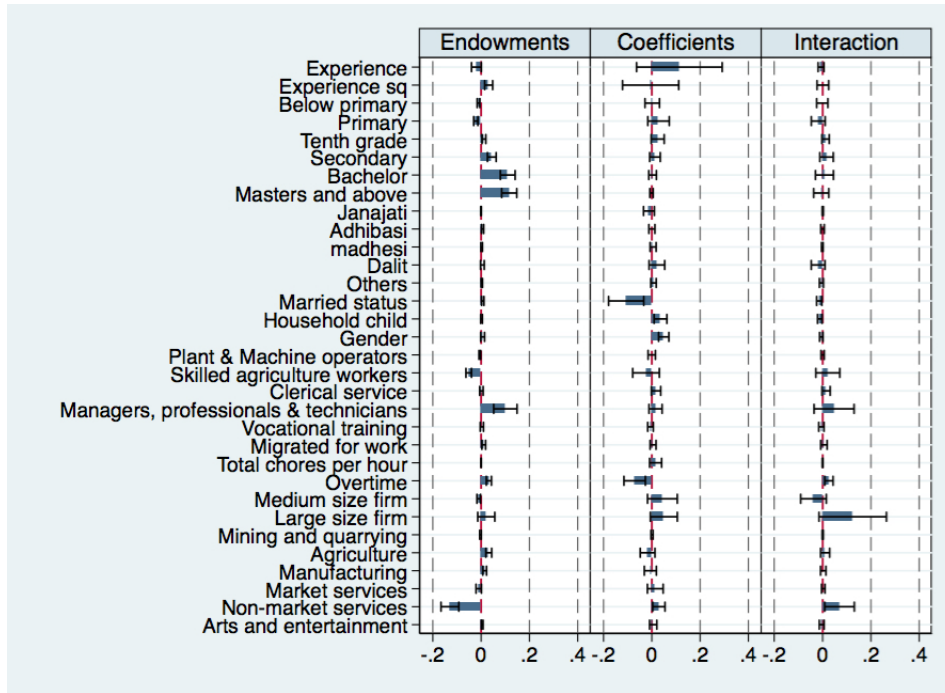


Figure 4.9: Threefold Blinder-Oaxaca Decomposition plot in mean wages for formal and informal employment

employees in informal employment when applying the formal employment’s coefficients to the informal employment’s characteristics. Furthermore, 35.62 percent is attributed to interaction, which measures the simultaneous effect of differences in endowments and coefficients. .

Table 4.13 on the next page and figure 4.9 provides the detailed decomposition of the endowment effects. The interpretation of the values is as: **How would a worker in an informal employment earn more (>1) or less (<1) if the endowment effects were adjusted to the endowments of formal employment, evaluated at informal employment coefficients?**

Experience is significant at 10 percent significance level and is associated with increase in hourly wage of 1 percent while squared of experience is significant at 1 percent significance level and on average earns 3 percent less than formal employment, adjusted for informal employment. Since age is already controlled for, experience is not biased with age in the labour market.

Education is significant at 1 percent significance level across all levels. With regards to distribution across education, where average wage level increases as education level increase, they show positive result for below primary and primary and negative result for rest of the educational level. An adjustment of informal employment levels to the one of the formal employments is associated with an economically valuable increase in hourly wages of 1-2 percent for below primary

Table 4.13: Earnings Gap Three Fold decomposition (Blinder-Oaxaca) between Formal employment and informal employment using different variables

	Endowments	%	Coefficients	%	Interaction	%	Total difference
experience	-0.019364	-2.99	0.1141135	17.62	-0.0064933	-1.00	13.63
experience squared	0.0312548	4.83	-0.0048964	-0.76	0.0010126	0.16	4.23
Education Level							
below primary	-0.0107466	-1.66	0.0018233	0.28	-0.0013983	-0.22	-1.59
primary	-0.0219151	-3.38	0.0279275	4.31	-0.0179599	-2.77	-1.84
tenth grade	0.0116325	1.80	0.0243549	3.76	0.0123095	1.90	7.46
secondary	0.0441931	6.82	0.0131358	2.03	0.0163841	2.53	11.38
bachelor	0.1101066	17.00	0.0032396	0.50	0.0076306	1.18	18.68
masters and above	0.1163745	17.97	-0.0012559	-0.19	-0.0057880	-0.89	16.88
Caste group							
Janajati	-0.000326	-0.05	-0.0117549	-1.82	0.0006668	0.10	-1.76
Adhibasi	0.0062259	0.96	0.0003321	0.05	-0.0001905	-0.03	0.98
Madhesi	0.0022452	0.35	0.0053855	0.83	-0.0012256	-0.19	0.99
Dalit	0.0052705	0.81	0.0210494	3.25	-0.0185196	-2.86	1.20
Others	0.0028267	0.44	0.0069962	1.08	-0.0049631	-0.77	0.75
Married status	0.0068816	1.06	-0.1060692	-16.38	-0.0138587	-2.14	-17.45
Household child	0.0017361	0.27	0.0359665	5.55	-0.011488	-1.77	4.05
Gender	0.0062975	0.97	0.0494156	7.63	-0.0052953	-0.82	7.78
Occupation class							
Plant and machine operator	-0.00527	-0.81	-0.0001785	-0.03	0.0000773	0.01	-0.83
Skilled agriculture, trade workers	-0.0512687	-7.92	-0.0239632	-3.70	0.0214997	3.32	-8.30
Clerical, service and sales workers	0.0012296	0.19	0.0175964	2.72	0.0144748	2.23	5.14
Managers and professional	0.100363	15.50	0.0154916	2.39	0.0474817	7.33	25.22
Vocational training	0.0030921	0.48	-0.0054254	-0.84	-0.0049777	-0.77	-1.13
migration for work	0.0109443	1.69	0.0051614	0.80	0.0055005	0.85	3.34
total chores per hour	-0.0000163	0.00	0.0157366	2.43	0.0000355	0.01	2.43
overtime	0.0320942	4.96	-0.0710734	-10.97	0.0261809	4.04	-1.98
Size of business							
Medium size firm	-0.0097124	-1.50	0.0438704	6.77	-0.0376485	-5.81	-0.54
Large size firm	0.0212552	3.28	0.0498085	7.69	0.1247326	19.26	30.23
Job Sector							
Mining and Quarrying	-0.002593	-0.40	0.0008240	0.13	0.0004275	0.07	-0.21
Construction	0.0316182	4.88	-0.0174272	-2.69	0.010503	1.62	3.81
Manufacturing	0.0146576	2.26	-0.0060233	-0.93	0.0026391	0.41	1.74
Market Services	-0.0098538	-1.52	0.0143332	2.21	0.0028125	0.43	1.13
Non Market services	-0.1291066	-19.93	0.0291996	4.51	0.0699304	10.80	-4.63
Arts and entertainment	0.0048323	0.75	0.0057689	0.89	-0.0037671	-0.58	1.06
Constant	0.0000000	0.00	-0.1414946	-21.85	0.0000000	0.00	-21.85
Subtotal	0.3049587	47.09	0.1119685	17.29	0.2307255	35.62	100.00

and primary education level and reduction in wages of 1–11 percent for rest of the education level.

With regard to those who are of Adhibasi caste group, and married, employees in informal employment would suffer minimal wage losses if they had the exactly same distribution across all variables as formal employment. There are only insignificant and negligible wage losses for the rest of caste group, having household child and gender of the employee.

The occupation class of the employees shows a particular interesting viewing. An adjustment of informal employment levels to the one of the formal employments shows minimal increase in hourly wages for plant machine operator and assemblers and 5 percent increase for skilled agriculture and trade workers. Meanwhile, the adjustment sees a huge decrease of 10 percent for managers, professional

and technicians, while an insignificant and minimal decrease for clerical, service and sales workers. Vocational training and total household chores are insignificant, whereas migration for work and overtime shows the minimal wage loss of 1 and 3 percent respectively if employees in informal employment would have same distribution across those variables as employees in formal employment.

In terms of the size of firm, however, for medium size business, an adjustment of employees in informal employment levels to the one of formal employment is associated with a minimal valuable addition in wages for employees in informal employment, while the large size firm remains insignificant. Regarding to the job sector of employment, adjusting for informal employment levels to one of formal employment shows the 1 percent decrease for manufacturing, 3 percent decrease for agriculture and minimal decrease for arts, entertainment and other service activities. Similarly, the adjust shows a minimal increase for market services and 12.9 percent increment for non- market services. It means, if informal employment levels are adjusted to formal employment for non-market services, their earnings would be increase by Rs. 1669 per month. This shows the situation of market where most of the non-market activities are performed on a low-level payment.

In table 4.13 on the previous page and figure 4.9 on page 38, we present details of the coefficient effect. The interpretation of the table is as : How would an employee in formal employment earn more (>1) or less (<1) if the formal employment coefficients were adjusted to the coefficient level of employees in informal employment, evaluated at the mean formal employment endowment levels?

The coefficient effect shows the higher pay off emerging from the Nepalese labor market favoring formal employment over informal employment. It quantifies as the change in wages of employees of informal employment when applying the formal employment's coefficients to the informal employment's characteristics.

Among the education level, tenth grade is significant and the difference in payoffs for employees in informal employment is 2.4 percent less than formal employment leading to a wage gap of approximately Rs. 310 gross monthly income. The difference in rest of the education are insignificant and of negligible difference. One interesting thing is the minimal marginal gain for employees in informal employment over formal employment, if they have completed masters or above. Although, the difference in pay off for informal employment over formal employment decreases with the increase of educational level and eventually surpasses in masters and above, there are no noteworthy deviations in the evaluation by the employer based on educational level in the Nepalese labor market.

Similarly, for caste group in comparison to Khas, except for Janajati, the difference in pay off for informal employment over formal employment is minimal

and insignificant. There seems to be highest of 5 percent discrimination in pay off for Dalit group, although it is insignificant. For the Janajati group, there is minimal and insignificant gain for employees in informal employment over formal employment. This implies there are no discrimination on the payoff for informal employment over formal employment in the labor market based on the caste group.

Married status is highly significant and the addition in payoff for married employees in informal employment over formal employment is 10.6 percent higher than unmarried employees leading to an approximate wage earning of Rs. 1372 per monthly income. Household child is significant, with the payoff in wages for employees having children in informal employment over formal employment is 3.5 percent less than employees having no children employees leading to an approximate wage difference of Rs. 453 per monthly income. Gender of the employees is also highly significant, whereby female employees in informal employment over formal employment earn 4.9 percent less than male employees, leading to an approximate wage difference of Rs. 634 per month. There appears high and significant addition in payoffs for employees who are married and significant discrimination for female employees having household children. Females having to look after children and conduct household chores in the labor market suffers differences in payoff in informal employment over formal employment.

The occupation class is insignificant and the payoffs is minimal for informal employment over formal employment except clerical, service and sales workers. Keeping elementary occupation as the baseline category, employees as clerical, service and sales workers are significant, and the wage difference is minimal at 1.7 percent for informal employment over formal employment. Furthermore, there seems no discrimination from employers side based on having vocational trainings, having migrated for job and household chores performed. Having performed overtime is significant, and in comparison to employees not doing overtime job, one who does overtime in an informal employment over formal employment have an additional payoff of 7.1 percent leading to increase in wage of Rs. 919 per month.

Regarding the size of the business, keeping small size firm (< 5 employees) as the baseline category, medium size firm is insignificant, while large size firm is significant. There appears a wage gap difference of 4.98 percent for employees in informal employment over formal employment, resulting in the monthly wage difference of Rs. 645.

In terms of the nature of the job sector, only non-market services is significant, and there exists a wage gap difference of 2.9 percent for employees in informal employment over formal employment. It is interesting to note, among job sectors, only non-market services was the job sector with the gain for informal employment

over formal employment, and the one with significant discrimination, resulting in wage difference of Rs. 375 per month. The rest of the job sector are insignificant and minimal. This suggests no difference in payoff based on coefficients among employees in formal and informal employment based on the job sector, except for non-market services.

Overall, the wage gap difference is highest (50.9 percent) with the differences in the educational attainment level, followed with large size firm (30.23 percent), managers, professional and technicians (25.22 percent) and experience (13.63 percent). For the educational attainment level, endowment effect as part of the total difference in wages is stronger at secondary and higher levels as compared to the endowment effect. Similarly, endowment effect is stronger for managers, professional and technicians too, compared to the discrimination effect. There exists higher discrimination effect based on the size of the business, with the higher the firm, higher is the discrimination between pay offs between formal and informal employment. The interaction effect as shown on table 4.13 on page 39 and figure 4.9 on page 38; between endowment effect and coefficient effect is highest for large size firm and non-market services. There is a scope for further study regarding the high unexplained component for large size firm and non-market services.

4.3.2 Sources of differential

We start by using a basic specification and include the control variables individually to gain insights in the relation between them and our variable of interest, namely 'log hourly wage'. The dependent variable in all the models is the natural log of the hourly wage. In the basic specification our controls for individual and household characteristics are experience, experience squared, educational attainment, caste group, married status and having household children. In order to allow for a nonlinear relationship between experience and our dependent variable, we include both experience and experience squared. Table presents a series of regressions in which we add controls at the occupational level (job-related characteristics) to the basic specification. In the regressions contained in Table we have also added employer related controls. We will now discuss our results.

Individual and household differential sources

In the table 1 and 2, five model specifications of individual and household characteristics are presented for formal and informal employment respectively. **The first model is the basic specification of experience, experience squared and education. All the coefficients are significant at 1 percent level, and models except for experience squared are positive.** Since the dependent variable is measured in terms of natural logarithm, we can interpret coefficients of the independent variables in

terms of percental changes. For all the dummy variables, we calculate coefficient -1 in order to obtain the correct coefficient in the determination of the relationship with the log hourly wage. The signs in the first model is positive for experience and negative for experience squared as predicted by the human capital theory. Education is a dummy variable consisting of seven dummies, each one representing particular education level. The illiterate level is omitted from the analysis and therefore is set as the benchmark category. Those who can simply read and write i.e. below primary level adds 32 percent to the wage rate in comparison to illiterate workers in formal employment, whereas 23 percent in informal employment. Primary level adds 55 percent and 32 percent respectively, tenth grade level adds 91 percent and 32 percent respectively, while a secondary level adds 110 percent and 49 percent respectively in formal and informal employment. Bachelor level adds 136 percent in formal employment whereas 85 percent in informal employment. Masters and above level have highest addition to the wage rate for both formal and informal employment at 155 and 113 percent respectively. Although there is positive effect of educational level in informal employment, the addition is greater in formal employment across all levels.

The second column in table 1 and 2 includes a control for gender, with male set as the base category. Gender is not significant for formal employment whereas it is significant at 1 percent significance level for informal employment. Being a male or female in the formal employment does not matter as such, you have similar experience and educational level. Being a female in informal employment decreases average hourly wage rate by 30 percent in comparison to male. There are basic alterations in the magnitude of the coefficients for both formal and informal employment in comparison to basic models, but the nature and significance of different coefficients remains the same.

The third column in table 1 and 2 includes a control for caste group consisting of five dummies, each of those representing different caste group in Nepal. Caste group Khas is set as the benchmark category. There is no significance of caste group across all levels in formal employment. In informal employment, Janajati group is significant at 10 percent significance level, and the rest of the caste group are significant at 1 percent significance level. Being Janajati in average earns 2 percent more in comparison to Khas, whereas Adhibasi earns 6 percent less, Madhesi caste earns 9 percent less, Dalit earns 5 percent and other caste group earns 10 percent in informal employment. The nature and significance of different coefficients with control for caste group remains the same, while there is change in the magnitude of the coefficients.

The fourth column in table 1 and 2 includes a control for married status, with

unmarried set as the benchmark category for formal and informal employment respectively. Marital status is not significant for formal employment, while it is significant at 1 percent level for informal employment. Being married earns 9 percent more hourly wage rate in average in comparison to unmarried in informal employment. The nature and significance of different coefficients with control for marital status remains the same, while there is slight change in the magnitude of the coefficients.

The fifth column in table 1 and 2 includes a control for having a household child, with not having children set as the benchmark category for formal and informal employment respectively. Having household children is significant for informal employment at 5 percent significant level while it is not significant for formal employment. Having a household child reduces average hourly wage rate by 1 percent in comparison to not having children. The nature and significance of different coefficients with control for household child remains the same across all kinds of employment, while there is slight change in the magnitude of the coefficients.

4.3.3 Job characteristics differential sources

In table 3 and 4, we present a series of specifications for formal and informal employment in which, besides controls at the individual and household characteristics level, we also include controls at the job characteristics. For the sake of comparison, in column 1 of table 3 and 4, we reproduce the same model specifications as in column 5 of table 1 and 2 respectively. The following six columns summarize the effect of adding one control variable on the job characteristics to each specification. Hence, the last model specification includes all control variables, both on the individual and the job characteristics.

We start by adding occupation class control in the column 2 for table 3 and 4, consisting of 5 dummies, each representing the occupation group. The omitted occupation class is “Elementary occupation”. Plant, machine operators and assembler and skilled agriculture and trade workers are not significant in formal employment, whereas they are significant at 1 percent significance level in informal employment. Similarly, both the clerical, service and sales workers and managers, professionals and technicians are significant at 1 percent significant level for formal and informal employment. In the formal employment, being a clerical, service and sales workers adds 20 percent more to the hourly wage rate, whereas managers, professionals and technicians adds 38 percent more in comparison to elementary occupation. Similarly, in the informal employment, being plant, machine operators and assemblers adds 9 percent, skilled agriculture and trade workers adds 24 percent, managers, professionals and technicians adds 15 percent whereas being

a clerical, service and sales workers decreases the average wage rate by 5 percent in comparison to the elementary occupation. The interesting effect is seen on being a clerical, service and sales workers, which adds to the wage rate in formal employment, but decreases the wage rate in the informal employment.

The third column in table 3 and 4 consists of control for the vocational training, where not having vocational training is set as the benchmark category. It appears vocational training is not significant for the formal employment, whereas it is significant at 5 percent significance level for the informal employment. Workers who have vocational training in average adds 2 percent to the wage rate in comparison to the ones who do not have any form of vocational training in the informal employment.

The fourth column in the table 3 and 4 includes of control for workers who have left their hometown, migrated to new places in search of the job, with those who were not migrated set at the benchmark. Migrated for work is significant at 1 percent for both the formal and informal employment. Workers who are migrated adds 11 percent in formal employment, and 6 percent in informal employment to the average wage rate in comparison to those who are not migrated for work.

The fifth column in the table 3 and 4 includes control for total chores per hour done in the formal and informal employment respectively, where workers who did not do any kind of chores are set at the baseline. It is significant at 5 percent in both the formal and informal employment, although the effect is positive on formal employment and negative on informal employment. Workers who does household chores adds 1 percent more in the formal employment, whereas they reduce 1 percent in informal employment of the average wage rate in comparison to those who don't do any household chores.

The sixth column in table 3 and 4 includes a control for workers who does overwork, which is calculated as workers who work more than 40 hours per week in formal and informal employment respectively. Overtime is significant at 1 percent for both the formal and informal employment. Workers who does overtime earns 23 percent in formal employment and 8 percent less in the informal employment in comparison to those who do not do any kind of overtime work.

Including the control for the occupation class makes the Adhibasi caste group significant at 10 percent significance and married status significant at 10 percent significance level from the original model in the formal employment. Similarly, control for the occupation class reduces the significance of Janajati caste group from 5 percent significance level to not significant at all in the informal employment. With the control for the migration for work, there is no change in the significance in the formal employment, but reduces the significance of household child from 10

percent significance level to no significance level in the informal employment.

Including the control for the migration for work reduces the significance of married status from 10 percent to no significance level and increases the significance of household child from no significance to significant at 10 percent in the formal employment. The control for migration for work has no changes on marital status and household child, but reduces the significance of vocational training from 5 percent significance to 10 percent significance level in the informal employment. Similarly, the control for overtime makes marital status significant from no significance to 5 percent significance level, and household child more significant from 10 percent significance to 1 percent significance in the formal employment. There is not much changes on significance level due to the control for overtime in the informal employment.

Employer characteristics differential sources

In table 5 and 6, we present a series of specifications for formal and informal employment in which, besides controls at the individual, household and job-related characteristics level, we also include controls at the employer characteristics. For the sake of comparison, in column 1 of table 5 and 6, we reproduce the same model specifications as in column 6 of table 3 and 4 respectively. The following three columns summarize the effect of adding one control variable on the employer characteristics to each specification. Hence, the last model specification includes all control variables, both on the individual, household, job and employer characteristics.

We start by adding the control on the size of business in the column 2 of table 5 and 6 for formal and informal employment respectively. Size of the firm is a dummy variable consisting of 3 dummies and “small size firm” is set as the baseline category. The medium and large size of the firm is significant at 1 percent significance level for formal employment, whereas only the medium firm is significant at 1 percent and large size firm is not significant for the informal employment. In comparison to small size firm, being in the medium size firm adds 29 percent more to the average hourly wage rate for formal employment and 8 percent more for informal employment. Similarly, being in large size firm adds 31 percent in comparison to the small size firm for formal employment. Since the large size firm are subject to higher legal and administrative scrutiny, and most of them fulfil the criterions of formality, there is no significance of large size firm in the informal employment.

The column 3 of table 5 and 6 includes the control for the economic job sector in formal and informal employment respectively. Job sector is a dummy variable consisting of 7 dummies and “Agriculture” is set as the baseline category. All of

the economic job sectors are significant at 1 percent significance level except for arts, entertainment and other service activities in the formal employment which is not significant at all. Similarly, all the economic job sectors are significant at 1 percent significance level except for non-market services in the informal employment, which is not significant at all. Being in the mining and quarrying; electricity, gas and water supply job sector adds 26 percent, construction adds 44 percent, manufacturing adds 18.4 percent, market services adds 25.3 percent and non-market services adds 28.1 percent more in comparison to the agriculture sector in the formal employment. Similarly, being in the mining and quarrying; electricity, gas and water supply job sector adds 12.7 percent, construction adds 33.6 percent, manufacturing adds 11.5 percent, market services adds 8 percent and arts, entertainment and other service activities adds 8.8 percent more in comparison to the agriculture sector in the informal employment.

Including the control for the size of the firm, the significance of plant, machine operators and assemblers increases from 10 percent to 1 percent significance, whereas the significance of Dalit caste increases to 10 percent significance level in the formal employment. Moreover, it also decreases the significance of clerical, service and sales workers from 1 percent significance to 5 percent significance in the informal employment.

Including the control for the job sector seems to make married status less significant from 5 percent to 10 percent in the formal employment, whereas the significance is unchanged in informal employment. Similarly, the control for job sector makes hourly wage rate for below primary education level workers completely insignificant from 1 percent significance level in the formal employment, whereas the significance is similar but there is decrease in the coefficients for informal employment. Furthermore, the control for job sectors increases the significance of large firm to 10 percent significance, whereas reduces the significance of being Dalit from 1 percent significance to 5 percent significance, clerical, service and sales workers from 5 percent significance level to no significance at all and total chores per hour from 1 percent significance to no significance in the informal employment.

4.4 Discussion

To address these issues, the government of Nepal has proposed a focused social security and protection program aimed at formalizing informal employment. Such a program has the potential to increase pay for workers and improve productivity, but will require employers to bear higher costs in terms of fines and detection risks. It will also require proactive labor market policies that target vulnerable groups and improve formal employment prospects for workers. Additionally, if informality

is to be reduced, it may be necessary to target more men, who tend to make more money than women and dominate the informal sector. This could involve policies to detect and punish informal employment as well as active labor market policies to entice workers into the formal economy.

However, it is important to recognize that the challenges facing informal workers in Nepal go beyond the wage differential with formal employment. Government labor provisions are applicable to all working citizens, but a gap in policies and interventions has excluded informal workers from these mechanisms, leading to wage inequality and increased discrimination. Despite increased liberalization and globalization, as well as the state's withdrawal from several industries, discriminatory practices in informal employment have not decreased. As a result, only a small percentage of workers in formal employment benefit from non-discriminatory laws, leaving a large number of informal workers vulnerable with lower protection and higher social and economic costs.

To address these challenges, it is necessary to develop separate policies for formal and informal employment that analyze the earning gap in Nepal. Relying on market forces alone may not be sufficient to minimize prejudice in the economy, and regulations must be put in place to cover informal workers. There is an urgent need for social policies and policy reform to include informal workers and promote the gradual formalization of employment, providing legal, social, economic, and work benefits. This will require a multifaceted approach that considers the complexity of the issues at play, including factors such as gender, education level, experience, occupation class, size of business, and sector of employment. By investing in higher value-added sectors, improving education and access to rights and benefits, and promoting gender equality, the government can work to improve the productivity and earning potential of informal workers and drive economic growth.

It is crucial for the government to prioritize the study of wage differentials between formal and informal employment in Nepal in order to effectively address these issues. By gaining a deeper understanding of the factors contributing to the wage differential, policymakers can design targeted interventions to improve the lives of informal workers and drive economic growth. This will require a comprehensive analysis of the supply and demand side factors at play, as well as the social and economic consequences of informal employment. Only by taking a comprehensive and nuanced approach to the issue can the government hope to effectively address the challenges facing informal workers in Nepal and build a more equitable and prosperous society.

This analysis is limited to examining mean hourly wage differentials and its causes from a supply side. The findings indicate that along with formality

or informality of employment, factors such as gender, educational level, experience, occupation class, size of business and job sector of employment affects the differences in payoffs. The combination of demand and supply side measures, investment to promote jobs in higher value added sectors, along with a focus on improved education, gender equality, and access to rights and benefits across job sector, occupation class and size of the business would gradually enhance the sectoral productivity as well as improved earning level of employees across informal employment.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study contributes to the current literature by defining informal sector employment and breaking down the disparities in earnings distribution between formal and informal sector employment for Nepal, where there is currently no empirical researches on informal sector employment and wages. This paper contributes to the study on whether there is differences in earning among employees in formal employment and informal employment in the Nepalese labor market. To this we have used the Nepal Labor Force Survey(NLFS) III, published by CBS (2019) covering approximately 77843 employees. We first carried out a series of (OLS) regressions to assess the role played by various variables in shaping hourly wages. Subsequently, we carried out a series of Oaxaca-Blinder decompositions to determine whether employees in informal employment faces a wage gap.

We have found that log hourly wage is positively significant to experience and educational level for formal employment. Similarly, log hourly wage is positively significant to experience, educational level and marital status while it is negatively significant to caste group except for Janajati, having household children and female informal employment. We have then included series of controls accounting for the job related characteristics in the basic model.

Among the occupation class, clerical, service and sales workers and managers, professionals and technicians are positively significant for formal employment on determining the log hourly wage rate. Similarly, all the occupation class is positively significant for wage rate, except for clerical, service and sales workers which is negatively significant on wage rate for informal employment. Workers migrated for work is positively significant, overtime work hour is negatively significant for formal and informal employment, whereas vocational training is positively significant for informal employment. Workers performing household chores is positively significant on formal employment and negatively significant on informal employment.

Including the control for the occupation class makes the Adhibasi caste group and marital status significant in the formal employment. Similarly, control for the

occupation class makes Janajati caste group insignificant and control for migration for work makes household children insignificant in the informal employment. Including the control for the migration for work makes married status insignificant and increases the significance of household child in the formal employment. Moreover, the control for migration for work reduces the significance of vocational training in the informal employment. Moreover, the control for overtime makes marital status significant to 5 percent significance level, and household child less significant in the formal employment.

We have then included series of controls regarding the employer characteristics in the aforementioned model. The medium and large size of the firm is positively significant for formal employment, whereas only the medium firm is positively significant for the informal employment. All of the economic job sectors are positively significant except for arts, entertainment and other service activities in the formal employment and all the economic job sectors are positively significant except for non-market services in the informal employment. Including the control for the size of the firm, the significance of plant, machine operators and assemblers increases, significance of Dalit caste increases and decreases the significance of clerical, service and sales workers in the informal employment. Including the control for the job sector seems to make married status less significant and below primary education level insignificant in the formal employment. Furthermore, the control for job sectors increases the significance of large firm, reduces the significance of being Dalit.

The Oaxaca-Blinder decomposition results provide evidence of wage gap differences between employees in formal and informal employment. As the overall wage difference presents, employees in informal employment earn about 64.77 percent less than in formal employment do. Of the total wage gap, 47.09 percent is attributed to endowment, which is the mean increase in the hourly wage of employees in informal employment if they had the similar characteristics as the employees in formal employment. Similarly, 17.29 percent is attributed to the difference in coefficient, which quantifies the change in wages of employees in informal employment when applying the formal employment's coefficients to the informal employment's characteristics. Furthermore, 35.62 percent is attributed to interaction, which measures the simultaneous effect of differences in endowments and coefficients.

Overall, the wage gap difference is highest (50.9 percent) with the differences in the educational attainment level, followed with large size firm (30.23 percent), managers, professional and technicians (25.22 percent) and experience (13.63 percent). For the educational attainment level, endowment effect as part of the total

difference in wages is stronger at secondary and higher levels. Similarly, endowment effect is stronger for managers, professional and technicians too, compared to the discrimination effect. There exists higher discrimination effect based on the size of the business, with higher the firm size, higher is the discrimination between pay offs between formal and informal employment. The interaction between endowment effect and coefficient effect is highest for large size firm and non-market services.

Multiple studies have found that informal workers in developing countries often earn lower wages than formal sector workers (Duman & Duman, 2021; Gerxhani, 2004; Henley et al., 2009; Kahyalar et al., 2018; Qu, 2011; Yamamoto et al., 2019) and that this wage gap is influenced by a variety of factors including education, age, gender (Becker, 2010; Borjas, 2005; Garc a & Badillo, 2018; Yamamoto et al., 2019), caste group (Adhikari et al., 2019; Parajuli, 2014), factors including experience, employment status and occupation (Badullahewage, Badullahewage et al., 2021; Becker, 2010; Mincer, 1974) and employer characteristics like job sector and size of the firm (Bargain & Kwenda, 2014; Borjas, 2005; Qu, 2011)

Our study contradicts with the findings of C. Williams and Gashi (2021), on a study done in Kosovo, where the finding shows that wage gap for female is less than male, whereas our finding shows the higher wage gap for female in comparison to male in both the formal and informal employment. Several studies also have found that earnings in the informal sector can be higher than in the formal sector in some cases. Fafchamps and Viarengo (2013) found that informal sector workers can earn higher wages than formal sector workers, particularly when the formal sector is subject to strict regulations or when informal sector work offers greater flexibility. Maloney (2004) found that informal sector workers may earn higher wages than formal sector workers when informal sector work is more specialized or when formal sector jobs are scarce. Similarly, Mohsin (2013) found that informal sector workers in some industries can earn higher wages than formal sector workers, particularly in industries with high demand for labor. These studies suggest that the earnings of informal sector workers can be influenced by a variety of factors, including the regulatory environment, the demand for labor, and the specialization of work.

5.2 Recommendations

In Nepal, the informal sector is a significant part of the economy and employs a large number of workers, including low-wage workers, agricultural laborers, and unskilled employees. These workers often earn less than their counterparts in formal employment and lack the same protections and benefits. This wage differential between formal and informal employment has significant consequences

for workers and their families, as informal employment can lead to poverty and economic insecurity. It also has broader economic consequences, as informal employment often involves low productivity and low wages, limiting economic growth and development.

The modernization hypothesis suggests that informal employment should decrease as a country develops, however, in Nepal and many other developing countries it remains high, potentially due to the liberalization of markets and promotion of flexible labor practices according to the neo liberal hypothesis, as well as political and economic factors such as government policies and regulations and the overall political and economic environment, which are emphasized by the political economy hypothesis. It is important for policymakers to consider these factors when designing policies to reduce the gap between earnings in formal and informal employment.

To minimize this gap, the Nepal government should consider implementing a range of policy measures that take into account these hypotheses. Promoting the growth of small and medium enterprises (SMEs) and encouraging the adoption of technology and automation, as well as providing training and education programs for informal workers and implementing policies that promote wage growth, can help to create more formal employment opportunities and increase wages in the formal sector. Additionally, addressing regulatory barriers and improving the business environment can make it easier for businesses to operate and create more formal employment opportunities. Providing social protections, such as unemployment insurance and pension schemes, to informal workers can also help to reduce the income gap between formal and informal employment. Increasing access to credit and financial services for informal workers and small businesses can also help them to grow and formalize their operations. Overall, a combination of these measures could be effective in reducing the gap between earnings in formal and informal employment in Nepal, while also taking into account the modernization, neo liberal, and political economy hypotheses.

5.3 Possible extension

There are several areas for future research to address limitations of this study, such as the reliance on the NLFS III dataset, which only covers the period of 2017/18 and does not allow for analysis of changes in the wage gap over time or comparison to other countries in South Asia. Future research could consider using panel or pooled data sources and cross-country data to more critically examine the wage gap between formal and informal employment in Nepal and identify trends or patterns. Additionally, the Oaxaca-Blinder method of wage decomposition could be used to examine the influence of individual characteristics on the wage gap,

and the impact of labor market institutions, technological change, firm size, globalization and trade liberalization, and labor market regulations on wages in both sectors could be analyzed. The economic and social consequences of informality for workers and their families, as well as the potential for policies aimed at promoting the growth of small and medium-sized enterprises and reskilling and upskilling programs, could also be studied as potential ways to narrow the wage gap.

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CHAPTER A.1

FORMAL JOB CHARACTERISTICS

Table 1.1: Controls on the job characteristics for formal employment

	Dependent variable: log(hourly wage)					
	1	2	3	4	5	6
experience	0.024***	0.022***	0.022***	0.022***	0.023***	0.022***
	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
experience squared	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***
	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Education Level						
below primary	0.307***	0.254***	0.255***	0.246***	0.247***	0.205***
	-0.081	-0.08	-0.08	-0.08	-0.079	-0.076
primary	0.535***	0.394***	0.398***	0.382***	0.387***	0.319***
	-0.074	-0.077	-0.077	-0.076	-0.076	-0.073
tenth grade	0.891***	0.607***	0.613***	0.588***	0.592***	0.486***
	-0.068	-0.078	-0.078	-0.077	-0.077	-0.074
secondary	1.086***	0.754***	0.764***	0.729***	0.733***	0.617***
	-0.07	-0.081	-0.082	-0.081	-0.081	-0.078
bachelor	1.340***	0.965***	0.974***	0.936***	0.940***	0.853***
	-0.072	-0.085	-0.085	-0.085	-0.085	-0.081
masters and above	1.532***	1.152***	1.161***	1.121***	1.127***	1.010***
	-0.075	-0.087	-0.087	-0.087	-0.087	-0.084
Gender						
	-0.01	-0.032	-0.031	-0.006	-0.035	-0.032
	-0.026	-0.026	-0.026	-0.026	-0.03	-0.029
Caste group						
Janajati	-0.027	-0.026	-0.027	-0.033	-0.034	-0.035
	-0.027	-0.026	-0.026	-0.026	-0.026	-0.025
Adhibasi	-0.084	-0.088*	-0.089*	-0.094*	-0.085*	-0.080*
	-0.053	-0.051	-0.051	-0.051	-0.051	-0.049
Madhesi	-0.031	-0.027	-0.025	-0.026	-0.022	-0.046
	-0.04	-0.039	-0.039	-0.039	-0.039	-0.037
Dalit	0.057	0.08	0.082	0.094	0.1	0.102
	-0.082	-0.079	-0.079	-0.079	-0.079	-0.075
Others	-0.049	-0.0003	-0.003	-0.007	-0.018	-0.022
	-0.104	-0.101	-0.101	-0.1	-0.1	-0.096
Married status	-0.038	-0.069*	-0.070*	-0.048	-0.065	-0.082**
	-0.041	-0.04	-0.04	-0.04	-0.041	-0.039
Household child	0.009	0.022	0.022	0.026*	0.025*	0.034***
	-0.014	-0.014	-0.014	-0.014	-0.014	-0.013
Occupation class						
Plant machine operator and assembler		0.028	0.034	0.057	0.06	0.121*
		-0.071	-0.071	-0.071	-0.071	-0.068
Skilled agriculture and trade workers		0.029	0.034	0.018	0.022	0.028
		-0.075	-0.075	-0.075	-0.074	-0.071
Clerical, service and sales workers		0.204***	0.208***	0.203***	0.200***	0.197***
		-0.056	-0.056	-0.055	-0.055	-0.053
Managers, professional and technicians		0.383***	0.387***	0.397***	0.395***	0.362***
		-0.057	-0.057	-0.057	-0.057	-0.054
Vocational training			-0.032	-0.028	-0.034	-0.033
			-0.024	-0.024	-0.024	-0.023
migration for work			-0.024	0.110***	0.104***	0.111***
				-0.025	-0.025	-0.024
total chores per hour					0.019**	0.008
					-0.01	-0.009
overtime						-0.235***
						-0.022
Constant	3.478***	3.551***	3.549***	3.507***	3.500***	3.756***
	-0.079	-0.08	-0.08	-0.08	-0.08	-0.08
Observations	1153	1153	1153	1153	1153	1153
R2	0.475	0.507	0.508	0.516	0.518	0.561
Adjusted R2	0.468	0.498	0.499	0.507	0.508	0.552
Residual Std. Error	8.163 (df = 1136)	7.924 (df = 1132)	7.921 (df = 1131)	7.857 (df = 1130)	7.846 (df = 1129)	7.487 (df = 1128)
F Statistic	64.212*** (df = 16; 1136)	58.203*** (df = 20; 1132)	55.551*** (df = 21; 1131)	54.792*** (df = 22; 1130)	52.731*** (df = 23; 1129)	60.168*** (df = 24; 1128)