DETERMINANTS AND WAGE DIFFERENTIAL OF INFORMAL EMPLOYMENT IN NEPAL

A Thesis
submitted to the Central Department of Economics
Tribhuvan University, Kirtipur, Kathmandu, Nepal
in Partial Fulfillment of the Requirements
for the Degree of
MASTER OF ARTS
in
ECONOMICS

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April-2021

LETTER OF RECOMMENDATION

Ms. PRABINA NEUPANE has prepared this thesis entitled Determinants and Wage Differential of Informal Employment in Nepal under my supervision. I hereby recommend this thesis for examination as partial fulfillment of the Degree of MASTER OF ARTS requirements in ECONOMICS.

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APPROVAL SHEET

This thesis entitled **Determinants and Wage Differential of Informal Employment in Nepal** submitted by Ms. PRABINA NEUPANE to the Central Department of Economics, Faculty of Humanities and Social Sciences, Tribhuvan University, in partial fulfillment of the requirement for the Degree of Masters of Arts in Economics has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the said degree.

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ACKNOWLEDGEMENTS

This thesis entitled **Determinants and Wage Differential of Informal Employment in Nepal** has been prepared for the partial fulfillment the Degree of Masters of Arts in Economics requirements.

I am pleased to take this opportunity to express my heartfelt gratitude to my thesis supervisor Dr. Resham Thapa-Parajuli, the Central Department of Economics, Tribhuvan University, for his valuable guidance, encouragement and suggestions throughout my work.

Similarly, I am grateful to Prof. Dr. Shiva Raj Adhikari, the Head, Central Department of Economics, Tribhuvan University, for his suggestions. I also feel privileged to express my gratitude to all the Central Department of Economics teachers for their gracious response to my queries. I want to thank all of the, department's administrative staff and the Central Library, for help during this study in very many ways. I am heartily indebted to my friends and family who encouraged me to complete this work in time.

I bear sole responsibility for any errors and discrepancies that might have occurred in this research report.

Prabina Neupane

April, 2021

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LIST OF ACRONYMS

CBS	: Central Bureau of Statistics
CEDECON	: Central Department of Economics
HH	: Household
ILO	: International Labour Organization
ICLS	: International Conference of Labour Staticians
M.A.	: Master of Arts
NLFS	: Nepal Labour Force Survey
NPC	: National Planning Commission
OLS	: Ordinary Least Square
PCA	: Principal Component Analysis
T.U.	: Tribhuvan University

CHAPTER I
INTRODUCTION

1.1 Background of the Study

In 2003, the International Conference of Labour Statisticians (ICLS) defined and distinguished the informal sector and informal employment. According (ILO, 2003), the informal sector refers to production units, whereas informal employment refers to jobs or work. Informal employment includes the total number of jobs or positions during the given reference period. An employee is considered to have informal jobs or employment if his/her employment relationship is, by law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits (social security, paid annual leave and paid sick leave). The operational definition of informal employment depends on employment status, job characteristics, and employment benefit received. Thus, informal workers are restricted from legal and social security protection, employment benefits, favourable working conditions, and health and safety preventions.

Informal employment includes the following six types of jobs (ICLS, 2013). They are: (i) own-account workers employed in their own informal sector enterprises; (ii) employers working in own informal sector enterprises; (iii) contributing family workers, irrespective of whether they work in formal or informal sector enterprises; (iv) members of informal producers' cooperatives; (v) employees holding informal jobs in formal sector enterprises, informal sector enterprises, or as paid domestic workers employed by households; and (vi) own-account workers engaged in the production of goods exclusively for own final use.

In the case of Nepal, the ILO (2003) distinguishes the formal and informal sector. The definition considers all government corporations, I/NGO, Informal Organizations, private households and farm or personal/private/family business as the institutions where employment or job available, could be formal or informal. The institution that keeps a record of account, registered business at the national level, employs six or more people with social security benefit at the specific workplace, is formal sector. Likewise, the farm or other business entity which does not record accounts, not registered at the national level, employs five or less without social security contribution at non-fixed premises are informal sector (Detail flow chart that

distinguishes the formal and informal sector is in Annex A). This study focuses on informal employment, not the informal sector so that the subsequent explanations is in this direction.

The most commonly used criteria to distinguish formal and informal employment are whether employers contribute to social security, followed by annual and sick leave entitlements. In this context, ILO (2003) provides the following six arguments about why informal employment exists in the economy. They are: (i) non-declaration of the jobs or the employees; (ii) casual jobs or jobs of limited short duration; (iii) positions with the hours of work or wages below a specified threshold (e.g. for social security contributions); (iv) employment by incorporated enterprises or by persons in household; (v) jobs where employee's place of work is outside the premises of the employer's enterprise (e.g. out-workers with an employment contract); and (vi) jobs for which labour regulations are not applicable, not enforced, or not complied with for any other reason. It means informal employment is a reality in any economy, which might have negative and positive economic arguments regarding just wage and other benefits.

Since informal employment also incorporates informal jobs outside the informal sector, there should be an issue of wages differential. The wage differential refers to the difference in wages between workers with similar skills/qualification or between workers with different skill/qualification within the same industry or other industry. Such wage differential might originate either due to worker-specific factors or firm-specific factors. The skill and education level, nature of the work, working experience, worker's gender, and marital status explain the nature of worker-specific factor. Similarly, the firm-specific elements like the firm's nature, size of the firm, type of the firm, and location of the firm's very enterprise and reputation are responsible for firm-specific factors to wage differential (Madan, 2019).

Despite a high education level, relative to males or urban females, rural females have fewer regular work opportunities, which leads to wage discrimination (Yamamoto, Matsumoto, Kawata & Kaneko, 2019). According to CBS (2019), employment by industry shows that one in every five person works in agriculture, forestry, and fishing in Nepal. When most male workers work in construction, manufacturing and transport industries, females take mostly jobs in agriculture, forestry, fishing, wholesale and

retail trade and education industries. It might lead to a differentiated payment system to the same level of work and workers; possibly unfair wage payment.

1.2 Statement of Problem

Two billion, 61.2 percent of the globally employed population, work in the informal sector, mostly in emerging and developing countries (Bonnet, Leung & Chacaltana, 2018). These workers are involved in informal jobs such as street vending, home-based work in global and domestic value chains, waste-picking, domestic work, contract jobs, and the list goes on. This kind of employment, mostly informal, shares 89 percent of total employment in Africa, South Asia with 88 percent being the second highest is in informal employment followed by East & South- East Asia (excluding China) at 77 percent. In the Middle East and North America, 68 percent of employment is in the informal sector; and Latin and the Caribbean 54 percent is informal. Eastern Europe and Central Asia represent less than half at 37 percent of total employment (Bonnet, Vanek & Chen, 2019). In Nepal, 84.60 percent of the employment is informal (CBS, 2017), above the global average and slightly below the South Asian average.

The formal industrial sector's low absorption capacity, informal economy's work flexibility, changing production structures in favour of informal works, the recent development of the business structure in favour of outsourcing, the labor regulation issues, economic crisis, and some micro determinants such as low skill and education level, discrimination, poverty and inadequate access to economic resources, financial and other business services and the market as such in some cases drive the informality (ILO, 2002). In some cases, the informality is the structural issues. In this context, ILO (2002) claims that informal employment provides a significant job and income during high employment circumstances, underemployment, and poverty as it is easy to enter, low requirements of education, skills, and technology and capital in the informal sector. Thus, informality is no choice but means to survival (ILO, 2002).

In Nepal's context, informal jobs are typical among women than men, though men work more in the informal sector (CBS, 2017). This report illustrates that the share of informal employment is higher among females (90.5%) than male (81.1%), while females are 91.8 percent and males are 83.8 percent employed in informality, a decade ago (CBS, 2008). Informal workers are not recognized or protected under

legal or other regulatory frameworks. They work in verbal contract, no formal written contracts. In this context, Upadhyaya (2003) states that informal employment involves irregularity of employment, wage rate's uncertainty and long or uncertain working hours with low income and risk to occupational health and safety. However, Adhikari (2018) concludes that informal employment plays a crucial role in employing a significant part of Nepal's economically active population, provides livelihood to millions of people in the country, absorbs surplus labours, and creates self-employment opportunity and raises their living standard.

The informal sector management could be one of the mechanisms to address the employment aspects of marginal and poor people in Nepal, which has insufficient economic opportunities (Agrawal & Dhakal, 2010). However, Thapa-Parajuli (2014) points out the constraining wage differential between formal and informal sectors, which might further generate a vicious cycle of poverty that the poorer are paid less and no social security safety net. The paper also highlights the deepening discrimination concerning educational level that less-educated informal workers neither receive social security benefit nor sufficient wage income. Thus, growing informality and the wage gap between formal and informal employment are development challenges in Nepal. Such discrimination might also have the skill and social dimensions; a worthy research topic.

ILO (2019) reveals that more than 70 percent of the economically active population are involved in informal employment in Nepal. It is rapidly increasing due to the changing pattern of employment like technological innovation's replacement with the workers, shift away from agricultural work and the growth of informal employment (ILO, 2006) and employees are facing enormous challenges and constraints, such as lack of occupational safety and health, restriction from social security, legal protection and benefits, low wages and poor working conditions as well (ILO, 2002). It has also indicated more than six out of every tenth worker, and four out of every fifth enterprise globally operate in the informal economy. Such vast expansion of informal employment may lead to the disparities among the employees in formal and informal sector in terms of wage, job security, social security, social protection, work intensity, working conditions, job safety, working hours, access to market, finances,

information, training and technology and so on. These can be significant subject for this thesis. However, the wage differential is the prime mover to discrimination.

Informal employment is an emerging issue in Nepal and the wage differential the economic yardstick to gauze fairness in society. The informal economic activities are increasing day by day. There could be unrecorded informal employment in the economy. In this context, the questions that arise are:

(a) What are the informal employment determinants in Nepal?
(b) Is there any wage differential among formal and informal employment in Nepal?
If yes, (c) is the wage differential has a gender, ethnicity, education and other dimensions too?

1.3 Objectives

The general objective of the study is to understand the Nepalese informal employment. The study's specific objectives concerning the research questions explicitly outlined in the previous subsection are as follows:

a) To analyze the determinants of informal employment in Nepal.
b) To estimate the wage differential between formal and informal employment in the Nepalese labour market.
c) To decompose the wage differential in terms of age, gender, marital status, education, and ethnicity among Nepal's formal and informal employment.

1.4 Significance of the Study

The informal employment and wage differential is an essential yet challenging topic to study in Nepal. The study helps determine informal employment factors such as age, gender, marital status, education level, training, ethnicity wealth, HH-size, male-headed household, land ownership status, and so on. As informal employment is a reality of the Nepalese economy, there might be specific differences in the worker's wage earnings in the informal sector compared to the formal sector. Understanding the degree and determinants of wage differential among formal and informal employment in the Nepalese labour market might have policy relevances. Besides understanding the nature of wage differential, the findings might help formulate the workers' compensation packages, if any. It is equally useful to the academic front that very few literature sources are available in Nepal's context. This study might add

some literature and further extensions in wage differential literature. So this research would be helpful in two facets; academic and empirical juxtapose.

1.5 Organization of the Study

The thesis report has five chapters. This introductory chapter is about the general background, statement of the problem, the objectives, and its significance. Following section, chapter II provides a theoretical and empirical literature review. chapter III is the research methodology that comprises nature and sources of data, description of the variable, estimation strategy, and the models' description. Chapter IV is about the data analysis for the determinants of informality and wage differential among formal and informal employment and interpretation of the findings. Lastly, chapter V concludes with a summary of findings and conclusions.

CHAPTER II
LITERATURE REVIEW

2.1 Introduction

This chapter is a review of journal articles, books, thesis and dissertation. The theoretical literature covers the ideas and the theories in this thesis topic, whereas empirical literature is about the facts and figures based analysis. We searched by the keywords 'informal employment', 'wage differential' and 'informality' in the 'Web of Science' platform, the prime source of empirical literature review. We retrieve some of the pioneering documents from goggle scholar and research gate too.

2.2 Theoretical Review

The informal sector is the economic or business units, exists primarily to create employment and the resultant income in the goods and services production process. These units typically operate at organization's low level, where labour relation is mostly casual employment, kinship, personal contacts and social network rather than contractual arrangements with formal guarantees. In the informal sector, the fixed and other assets belong to the owner rather than production units, means, capital goods, such as buildings or vehicles may also be undifferentiated for business and household purposes. In some cases, the informal sector is similar to the household enterprise. These units neither can engage in a transaction nor enter into contracts with other units and cannot incur liabilities on their behalf, whereas the owners are liable for any obligations or debt incurred in the production process. Production cost is mostly undifferentiated from the household expenditure. The activities executed by the informal sector avoid tax payment or social security contribution or infringing labour or other legislations or administrative provisions. Therefore, "Employment in the informal sector includes all jobs in informal sector enterprises or all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their employment status, whether it was their main or a secondary job" (ICLS, 1993).

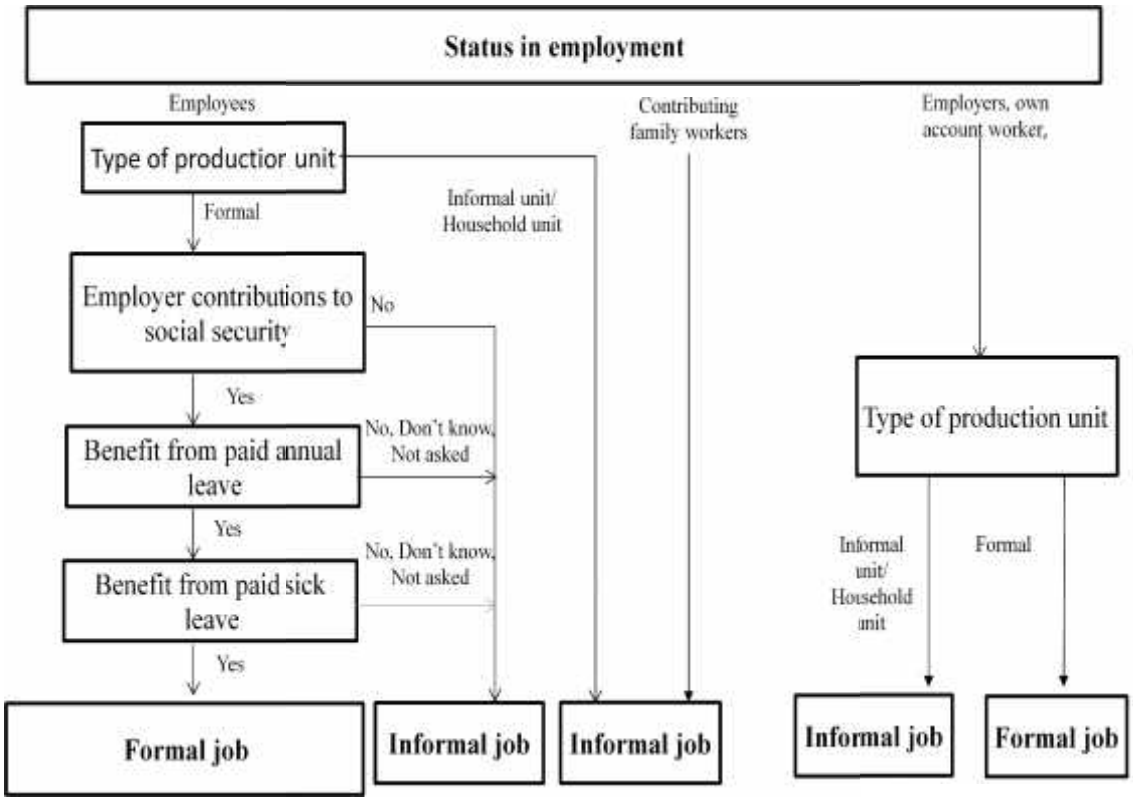
ILO (2003) states, in the case of Nepal, the institutional sector are classified into formal sector, informal sector and the households. Formal sector includes the government, state-owned enterprise corporations, non-profit institutions, I/NGO, etc.

They are registered under the national legislation by relevant authority. The private farm or business are the enterprises owned by individuals or households, not constituted as separate legal entities, means the business firms are not registered with relevant authority. So, the private business firms are considered as the informal sector. The households producing goods exclusively for their own final use, such as construction of house by own-self, subsistence farming, and the households employing the paid domestic workers too comes under informal sector (Detail flow chart that explains the informal sector of Nepal is in Annex B).

Informal employment is defined as the total number of informal jobs accomplished in formal sector enterprises, informal sector enterprises, or households, during a given reference period. The informal employment's conceptual framework divides the total employment into two dimensions: type of production units and type of job. The type of production units is the legal organization and other enterprise-related characteristics, while type of job is the employment status and other-job related characteristics. The productions units are classified into: formal sector enterprises, informal sector enterprises, and households. Formal sector enterprises include corporations (including quasi-corporate enterprise), non-profit institutions, unincorporated enterprises owned by government units, and private unincorporated enterprises producing goods and services for sale or barter. Informal sector enterprise includes private unincorporated enterprises (excluding quasi-corporations) owned by individuals or households or by several members of same households, as well as unincorporated partnerships and cooperatives formed by different households members that lacks the complete sets of accounts. Households produces goods exclusively for their own final use (e.g. subsistence farming, do-it-yourself construction of own dwellings, and households employing paid domestic workers (e.g. maids, laundresses, gardeners, watchmen, drivers etc.), but the households employing unpaid domestic or personal services (e.g. housework, caring for family members) are excluded. Jobs are categorized into status-in-employment under formal and informal nature. The employment status constitutes own-account workers, employers contributing family members, employees, and members of producers. The basis of distinguishing informal jobs are: the enterprise, too small job location and/or unregistered, jobs outside legal legislations or not applied to atypical jobs (such as

casual, part-time, temporary or home-based jobs) or to subcontracting arrangement in production chains (such as industrial outwork) (Hussmanns, 2004).

Figure 2. 1 Informal employment Nepal flowchart



Source: ILO, 2003

ILO defines informal employment from the two dimensions: type of production units and the type of job. The production units are classified into formal sector enterprise, informal sector enterprise and the households. These all are explained above. The employees with formal type of production unit provide benefits such as employer contribution to social security, benefit from paid annual leave, and benefit from paid sick leave. The employees with informal production unit or household unit and contributing family workers fall under an informal job, are restricted from these benefits. Similarly, employers, their own account worker with informal production unit/ household unit are informal job, whereas with the formal production unit comes under a formal job.

Therefore, Suwal and Pant (2009) claims, the registration criterion of informal economic activities are impractical. He further states, there is no effective follow-up or enforcement system to register for an establishment. The household surveys, the

basis of informal employment estimates, are irregular and these estimates are limited to some aggregates because of lack of transactions' detail information. Thus, he concludes, regular surveys are required to capture the economic activities. Hence, measuring the unofficial sector is fraught with difficulty.

Figure 2. 2: Conceptual framework for the informal employment

Production units by type	**Jobs by status in employment**								
	Own-account Workers		Employers		Contributing family	Employees		Members of producers'	
	Informal	Formal	Informal	Formal	Informal	Informal	Formal	Informal	Formal
Formal sector enterprises					1	2			
Informal sector enterprises(a)	3		4		5	6	7	8	
Households(b)	9					10			

a) As defined by the Fifteenth International Conference of Labour Statisticians (excluding households employing paid domestic workers).

(b) Households producing goods exclusively for their own final use and households employing paid domestic workers.

Note: Cells shaded in dark grey refer to jobs, which, by definition, do not exist in the type of production unit in question. Cells shaded in light grey refer to formal jobs. Un-shaded cells represent the various types of informal jobs.

Employment in the informal sector: Cells 3 to 8.
Informal employment: Cells 1 to 6 and 8 to 10.
Informal employment outside the informal sector: Cells 1, 2, 9 and 10

Source: ILO, 2003

The explanation of informal employment on the basis of nature of jobs are as follows:

Contributing family workers: Cell 1 and 5 covers the contributing family workers, who works in either formal or informal sector enterprises. The contributing family worker's jobs is informal in nature as they do not have explicit, written contracts of employment, and their employment is not subject to labour legislation, social security regulations, and collective agreements, etc.

Employees: Cell 6, 2 and 10 covers employees holding informal jobs, employed by formal sector enterprises, informal sector enterprises or as paid domestic workers by

households respectively. Employees are considered to have informal jobs if their employment relationship is not subject to national labor legislation, income taxation, social protection or entitlement to certain employment benefits (advance notice of dismissal, severance pay, paid annual or sick leave, etc.). The reasons of it are: non-declaration of the jobs or the employees; casual jobs or jobs of a limited short duration; jobs with hours of work or wages below a specified threshold (e.g. for social security contributions); employment by unincorporated enterprises or by persons in households; and jobs where the employee's place of work is outside the premises of the employer's enterprise (e.g. outworkers without employment contract).

Own-account workers: Cells 3 and 4 covers the own-account workers and employers, employed in their own informal sector enterprises. The informal nature of their jobs follows directly from the characteristics of the enterprise, which they own.

Employees holding formal jobs in informal sector enterprises: Cell 7 covers this section where employees holding formal jobs in informal sector enterprise are excluded from informal employment.

Members of informal producers' cooperatives: Cell 8 represents the informal nature of worker's job is directly related to the characteristics of the producers' cooperative where workers are the member. The cooperatives here, are not established as separate legal entities.

Households: Cell 9 covers the own-account workers engaged in the production of goods exclusively for own final use by their household (e.g. such as subsistence farming or do-it-yourself construction of own dwellings, etc.).

Developing countries carries the significant economic activities in the informal sector. The determinants of size of the informal sector depends on the factors such as tax and regulation, financial market development, and the quality of legal system. The channels affecting informality was tested by building simple analytical framework using an integrated data set. The quality of legal framework was important in determining the size of informal sector. But, the significance of taxes, regulations and financial constraints was reduced in the context of a well functioning legal system. Firm size is negatively correlated with the propensity to go informal, financial constraints tends to increase informality among small firm but not among large firms,

whereas legal obstacles induce informality among large firms (Dabla-Norris, Gradstein, & Inchauste, 2008).

This article points various dimensions and the causes of informal employment in the Bangladesh labour market and the associated wage penalty. The Labour Force Survey's data with mean and quantile decomposition was used to estimate the wage penalty originality from informality. The significant wage differential was found between formal and informal paid employees, formal paid and informal day labour and formal paid and informal self-employed. The wage gap ranges between 65.0 percent and 225.0 percent due to observed difference in human capital and job characteristics, and the wage premium amassing from formal employment (Rahman, Bhattacharya, & Al-Hasan, 2019).

The book studies the labour informality pattern (defined as the share of all employment with no access to social security) according to age, gender education level, employment sector, profession, marital status, employment status and geographic area in a selected group of countries in the Middle East and North America (MENA) region. Countries based on agriculture (such as Morocco and Yemen) has more share of employment in informality whereas those countries (such as Egypt, Syria, Lebanon) with larger public sector and more urbanized sector had lower share of overall informality. It was found, informality rates were very high among youth between ages 15 and 24, but after 24, informality decreased rapidly until 40-45 as the individuals entered from youth to adulthood, they moved into the public sector jobs. The results showed the informal worker are disadvantaged than formal workers in terms of social risks and they were employed in low-productivity/low pay jobs (Angel-Urdinola, & Tanabe, 2012).

Most people move into informal employment not by their choice but survival need. It can be due to high unemployment, underemployment and poverty, access of significant job in informal economy and income generation potential because it is relatively ease to entry and low requirements for education, skills, technology and capital. Such informal job lacks the criteria of decent work. It is characterized by small or undefined work places, unsafe, unhealthy working conditions, low levels of skills and productivity, low or irregular incomes, long working hours and lack of access to information, markets, finance, training and technology as the workers are

not recognized, registered, regulated, or protected under labour registration and social protection. In informal economy, workers receive little or no social security. Since the enterprises or workers and economic units are unregistered and unregulated, they often do not pay taxes, benefits and entailments to workers that leads unfair competition to other enterprises. This situation prevent the government to generate revenue, thereby limiting investment in social services (ILO, 90th session, 2002).

Hassan (2018) stated informal sector covers third to half of total economy in the world. Bangladesh is also a part of it. So, it accounted 35 percent to 78 percent of the total economy in past decade. The major reasons of this huge informal sector are bureaucracy and corruption, legal framework quality, large tax size and social contribution burden. This large informal sector constructs policy failure and significant discrimination. It may help in economic growth in short run but may reduce productivity in long run. It can be controlled by information transmission, reducing excessive tax, macroeconomic stabilization, improving regulatory framework, etc.

The constraint of unemployment seen in Nepal are "Remittance Cushion"/ vicious cycle of high remittance, poor sectoral growth, low labour productivity, old labour law and limited social security coverage, unscientific education, underemployment and large informal sector. When there is more remittances, there will be little pressure to improve policy weakness to the government which causes inadequate climate with low private investment that leads to low growth. So, there will be limited job opportunities in the country, resulting in more migration and ultimately causes increase in remittance. Also absent in working population both skilled and unskilled effect in the growth of agriculture and non-agriculture sector. Agriculture sector has low sectoral growth as this sector utilizes low skilled/semi-skilled and more unskilled labour who ultimately goes for foreign employment and there is problem of underemployment in this sector (Raut, 2013).

The first challenges of employment, for the countries like Nepal, where the poverty is acute, people tries to find some work for living rather than being unemployed as the unemployment benefits are absent. The second challenge is to upgrade the productivity and earnings with respect to the employed population segment. Since, the huge segment of population are associated to the informal segment of the economy,

where productivity and earning are low and the condition of work is poor. The third dimension of employment challenges is to shift the sector composition of population as the labour force are moving from agricultural sector (where productivity is lower) to the non-agricultural sector (where productivity is higher) mainly in manufacturing and service sector. However, the productivity in agriculture is increased due to both decline in numbers of workers remaining there and to the adaptation of technology and inputs (Islam, 2014).

India has been fastest growing economy in the world, but the employment in total and non-agricultural sector has not grown to that extent. This means India is facing jobless growth due to growth in casualization and informalization which implies there is shift in job from one to another i.e. no permanent job and the economic activities are away from the formal regulation that comprises labour law, wage policies, health and safety rules and tax accounting. This issues has become challenging to achieve the decent work for inclusive growth and sustainable development during 12^{th}Five Year Plan $(2012 - 17)$ (Mehrotra, Gandhi, Saha, & Sahoo, 2012).

The economy of Nepal is mostly informal as large proportion of economic activities are unobserved. So, there is a significant proportion of an informal employment. There are various socio-economic determinants of informal employment such as ethnicity, urban or rural areas, wage level, marital status, separated and divorced, gender and so on. Male are more into informal jobs. People are more likely to work in informal sector despite of their ages. People with primary education level or below and secondary education participate more in the informal job. But, people with higher education qualification are more likely to work in informal sector for employment. There is a wage differential in both formal and informal sector as the educational returns are discriminated with respect to sector and educational level. There is wage differential for relatively educated workers in an informal sector than in a formal sector (Parajuli, 2014).

Yamamoto and Kaneko (2017) analyses the gender wage gap for regular and casual workers in Nepal using a data representing over 6,000 workers from the Nepal Living Standard Survey. They find there is a higher wage gap in regular employment for rural workers, though it decrease in casual employment. They further reveal that women in rural areas have difficulty finding regular work, so most are involved in

casual work or unemployment. This indicates, women in rural areas, despite high education level suffers from large wage discrimination and less opportunity for finding regular work.

Meghir, Narita, and Robin (2015) developed an equilibrium wage-posting model with the help of Brazillian Labour Force Survey data in formal or informal sector of the heterogeneous firms among the workers, who search randomly on and off the job. A fact is observed in the data, the firms in the different sectors has the equal productivity in equlibrium. The wages, total output, welfare can be increased by allocating workers to the higher productivity jobs as well as improving competition in the formal labour market. They also found tightening enforcement does not increase unemployment.

Araujo, Ponczek, and Souza (2016) developed a model that determine the role of labour courts on the wage distributions in both formal and informal sectors by using the Brazillian data. From the literature review, it was found, wage gap and productivity of labour has the negative relationship, when there was the presence of active labour courts. Therefore, job regulation and justice branch affect the labour contract. The active labour courts decreases the unskilled worker's informality but do not have any impact on worker's formality.

The paper studied gender discrimation on the basis of wage earning in both formal and informal jobs in urban Brazil. Employment protection legislation failed to include large share of employees working informally. There was a wage gap of five percent in an informal jobs and seven percent in a formal jobs on an average from the different male and female workers selection procedure. Firstly, female employees had better job observable characteristics such as education attainment than male employees. When the observable characteristics were controlled, the adjusted wage gap on average was about 24 percent and 20 percent among formal and informal employees respectively. Secondly, it was found that there was also unobservable characteristics of men and women in both jobs. Gender wage gap was high and goes on increasing with the level of education in a formal job whereas in an informal jobs, wage offers was same for male and female employees (Ben Yahmed, 2018).

Docquier and Iftikhar (2019) applied search- and- matching setting to develop the employment structure and wage differential between different skill groups in same

sector and between workers with similar skills employed in different sectors. The paper's purpose was to study the effect of brain drain on development and inequality using two sector model with formal and informal labour markets. The study was conducted on 33 Sub-Saharan African countries using the model. They found skilled emigration lead to heterogeneous welfare losses whose size varied between 0.2 and 8 percent and was affected by the parameter of production and education technologies for low-skilled population.

The source of regional wage disparity in developing countries was the regional heterogeneity besides the differences in the endowment of human capital. The role of education and informality in regional wage differential was studied by using micro-data of Columbia. Regional heterogeneity in relation to education is intense in the upper part of wage distribution whereas heterogeneity in the informal sector is more at the bottom (Herrera-Idarraga, Lopez-Bazo, & Motellon, 2016).

Herrera-Idarraga, Lopez-Bazo, and Motellon (2015) studied the presence of educational mismatches in the formal and informal employment of a emerging country in returns to education. There was differences in both sectors regarding returns of surplus, required and deficit years of schooling which vary along the wage distribution for both sector's workers. Informal workers faced low returns to their education as well as they have to pay penalty associated to educational mismatches. So, the informal workers had suffered a lot than the formal workers.

A study conducted in the Turkish Labour Market's data of 2004 and 2009 shows that there is existence of a wage gap between formal and informal sectors. They also found education and experience are the key determinants of earnings (Kahyalar, Fethi, Katircioglu & Ouattara 2018).

2.3 Empirical Review

The paper shows the share of informal employment has been increasing except in Bulgaria, Latvia and Romania. Informal employees significantly earned less (between 25-30%) in real terms (398-490 euro per month compared to 580-662 euro of formal employees), were eight years younger and six years less experienced than formal employees. In formal employment, there was about 10 percent more employees with university degree and more married individuals were informal employees, had low-

skilled jobs. Mincer Model suggested; education, skills and experience has played highly significant role in wage determination, and male and married employees tend to have higher income. So, this model is based on human capital theory. There was 25 percent of wage penalty for an informal employment for all employees as well as 24 percent of wage penalty was for male and 28 percent for female employees was explained by both individuals and job characteristics. However, 15 percent of overall wage penalty remain unexplained, out of which 12 percent for male and 18 percent for female employees. Fixed effects regression suggested even when unobservable characteristics was accounted, wage penalty doesn't disappeared but it was 22 percent for male employees and 7 percent for female employees. In Oaxaca-Blinder wages decomposition, the difference between formal and informal employees was balanced. The characteristics of the firms (industry, job position and size) on the demand size explain this difference than the workers characteristics (age, education & marital status) on the supply-side. Pooled quantile regression tested uniform distribution of earnings which not only estimated mean earnings but also quantile. This regression was carried out for both male and female employees. The result suggested, there was no premium for participation in the informal employment. So both employees had wage penalty for informality. The highest at bottom decile was -0.24 for male employees and -0.27 for female employees and lowest decile at the top decile was -0.31 and -0.20 respectively (Nezhyvenko, 2018).

Informal employment in Ukraine had increased rapidly from 14.8 percent to 22.3 percent of total employment (15-70 years of age) over the time period 2000-2007. According to LFS data in 2007, there is large of informal employment between the age groups of two extremes (15-19) and (60-70) years than in formal employment. The employment in informal sector is more likely to decrease with education attainment for both sexes as well as for urban verses rural areas (Nezhyvenko, 2018).

Rukundo (2015) focused in the analysis of informal sector employment in Rwanda. The data was collected from 600 respondents employed informally in small and medium enterprises engaged in food processing across all provinces of Rwanda. The linear probability model was used in this study. The result showed that training attained on the job is positively significant to the job, while education level had a negative significance on the informality. Less educated workers were more employed

in the informal sector than formal sector, mainly due to limited capital in the informal sector. Similarly, wage also had positive effect on the informality. Likewise, the payment mode in informal sector was significant, since the payment was paid either on daily, weekly or monthly basis. Employees preferred such payment mode as their employment is not guaranteed. According to the interview conducted with respondents, 78 percent didn't know about their employment status and they wanted their payment to be on weekly basis.

Aikaeli and Mkenda (2014) examines empirically the determinants of informal employment in Tanzania's construction industry. The Logit regression model was applied to analyze the significant factors that influence the informal employment for micro and small entrepreneurs. The result indicated, higher earnings in the informal jobs compared to formal jobs. Another factor that made micro and small entrepreneur to commence the informal employment rather than formal one was due to lack of capital. In addition, the result revealed, low education (i.e. inadequate skills and knowledge) was one of the key reason workers were hired informally by formal firms. Another reason was these workers were employed at low wages by the formal firms. The another finding of this study was more females were employed informally than men and most of the job was related to office handling and clerical matters.

The study explored the nature, distribution and determinants of informal employment within youth aged 15 to 29 years in Southern Province of Sri Lanka. Informal sector contributed 87.4 percent in this province in 2011. Further, 78.2 percent was in informal sector while 99.3 percent of the informal employment was in informal sector. It was found, individual informality is significant positively with male, age groups of 25-29, and 50+ years, whereas it is negative with senior secondary, collegiate and tertiary level education, English liberate and with urban estate sector's individual. The spouse is more likely to be informally employed if the household head is in informal. In this province, 20 percent of population were youth out of which 74 percent of them are in informal employment. Male youth informality is four times more female youth. 60 percent of urban youth, 75 percent youth, 50 percent estate youth were informally employed. 96.2 percent informal employment was in private sector. The workers with no schooling and primary educated youth (70 percent) and collegiate youth (60.6 percent are informally employed. In addition, 80 percent of the

youth was illiterate and about 78 percent of them was employed informally (Bandara , 2018).

Görmüş (2017) investigated differential impacts of socio-economic determinants on informal employment by age using Turkish Household Labour Force Survey's micro data from Turkish statistical Institute. The Logistic regression model was applied for this. The result conveyed, the factors such as range of workplace characteristics, flexible work and work- related nominators, manufacturing industries, micro and small sized establishments, lower or minimum levels of education, and lower ranked occupations influenced the informal youth employment. It was found service industries, medium and large sized establishments and higher educational attainments helped to reduce an informal youth employment.

The study comprises main micro-determinants of informal employment in MENA. A simple Probit regression model was used for the informality analysis. Binary variable was regression model's dependent variable, where one if the worker was employed in the informal sector and zero otherwise. The major independent variables used was strata (on urban dummy), demographic characteristics of the workers (a male dummy, a married dummy, and the worker's age group), the worker's highest educational level attainment, employment status and the worker employed ownership firm's sectors. It was introduced urban workers was only 3 to 12 percent less likely to be employed informally controlling other factors. Hence, informal employment in a rural was more than in an urban. In countries like Egypt and Morocco, male workers had probability of 1 to 12 percent of being in the informal employment whereas 6 to 17 percent higher in Iraq, Lebanon, Jordan and Syria. In Yemen, gender didn't seem to be important determinant of informality. Married person has 10 to 14 percent probability to be in the informal sector by married person in Egypt and Lebanon and 2 to 8 percent probability in Morocco, The Republic of Yemen and Syria. Marital status was not significantly linked with informal employment. Countries such as Egypt, The Republic of Yemen and Syria showed adults aged 35 and other, 13 to 34 percent less tend to work in informal sector than youth 15 to 24. But adults of 25 and older were only 2 to 8 percent tend to work in formal sector than youth aged 15 to 24 in Iraq, Lebanon, Jordon and Morocco. So, there is less relationship between age and informality in these countries. Since, entering in informal employment in younger age

helped to gain experience and ultimately paved the way to enter in formal employment, reduced the informal employment with age. There was negative relationship between higher education and informality. It was found, there was low probability of 5 to 18 percent of being in the informality with high school education attainment but it was even 47 percent lower probability with tertiary education. The countries (Egypt and Lebanon), where tertiary sector is more developed like financial services, transport tourism, communication, has less probability of 4 to 13 percent of working informally as compared to secondary sector (manufacturing and construction). The countries where information about ownership is available had higher probability of 30 to 85 percent of being in formal employment than workers in the private sectors. Workers in medium-size (large size) firms were 16 to 12 (17 to 53) percent less likely to work in informal sector compared with workers in small-size firms (Angel-Urdinola, Tanabe, & Hilger, 2014).

Villanuera and Lin (2020) conducted study using micro data of 43 national household surveys between 2000 and 2017 in Argentina, Brazil, Chile, Mexico, and Peru, finds mother receives lower wages than childless women in those countries and the wage penalties ranges from 12 percent in Brazil to 21 percent in Chile. Mothers who are likely to work in informal sector accounts the wage gap.

Quiroga-Martínez and Fernández-Vázquez (2021) estimated Probit model in recent micro-data study that includes more than 11,000 workers relates the probability of belonging to the formal or informal labour market depending on his/her years of schooling and other control variables, finds that informality rates, the stock of educational capital and the mean wages present large variations across the Argentinean province and between the formal and informal labour markets, ranging from more than 40 percent in Tucuman to less than 17 percent in Buenos Aires city. He further concludes, to decrease the wage inequality, since higher number of schooling years is associated to lower informality in the labour markets, given that formal labour market present smaller inequalities, so he suggested a policy designed to increase the labour's force schooling years could lead to reduce the inequalities in the country.

Thailand, a country of middle income status, the informal employment is the source of earnings for large share of employment. The Oaxaca-Blinder test establishes a

systematic and statistically significant disparity between formal and informal employment earnings. The decomposition analysis shows that characteristics of workers account 67.9 percent for average monthly earning differential. The average monthly earnings of the non-farm self-employed workers is higher than farm self-employed workers. The variable 'age,' regarded as the experience of workers, plays a significant role in disparity since older workers are likely to earn more than younger ones. The bachelor degree education and urban variable are the main factors contributing to earning disparity between employment types as workers with these attributes earn more. The second empirical analysis using a Quantile regression method shows worker's earnings in informal employment are significantly lower than in formal employment. The common characteristics that explain the earning differential are gender (men earn more than women), the higher educated are likely to have higher earnings, those living in urban areas earn more than living elsewhere, earning in agriculture sector is lowest, non-farm self-employed are likely to earn more and those with multiple jobs are likely to earn less than those with single job (Dasgupta, Bhula-or & Fakthong, 2015).

Rand and Torm (2012) examines the wage differential between formal and informal manufacturing household enterprises in Vietnam based on firm survey data from 2009. For this, Blinder-Oaxaca decomposition method is used. The result reveals that average wages are 10%-20% higher in formal firms and the majority gap is due to observable characteristics, differences in firm size, workforce characteristics and location, whereas differences in firm age, owner gender, education, and technology of the sectors do not play significant role in explaining the differential.

A study in Cote D'lvoire identifies the micro-determinants of informal employment using National Survey on Employment and the Situation of Informal Sector, focuses on socio-demographic factors. The Logit model is estimated. Education level, age, gender, marital status, sector and urban-rural areas are the major determinants of the informal employment. The empirical results indicate; unschooled and less qualified individuals are more likely to be in informal job, the probability of engaging in informal activities is higher for women than men, the probability of involving in informal job decreases with the age of an individual, singles are more into informal job than married, individuals in the agriculture sector are more likely to be in informal

job than those in the service and industrial sectors, individuals living in urban areas are less likely to engage in informal employment compared to rural areas (Kouadio & Gakpa, 2020).

Youths in the Middle East and North Africa face the highest unemployment rates in the world. So, those who are employed are pushed to accept informal jobs that are insecure, unsafe, and lack non-wage benefits. Precarious employment is prevalent among lower socio-economic groups, leading to misery across generations. The nature of vulnerable employment-especially youth unemployment and informality and workers' transitions to decent work using multinomial Logistic regressions is studied using recent Labour Market Panel Surveys for Egypt, Jordan, and Tunisia. The growth trends of informal employment, particularly for youth cohorts was found. Especially in Egypt and Tunisia, children of poorer and less educated parents work in informal job and are unlikely to attain formal employment (Cheikh & Moisseron, 2021).

Kumar and Pandey (2021) studies on the wage differential between formal and informal workers across diffrent sectors, gender, occupation, and industry from National Sample Survey Office (NSSO) unit's data. They find out gender, caste, religion and region are the factors causing wage differential. This study utilizes percentage relative gap (PGR) for the absolute wage gap between informal and formal workers, applies Blinder-Oaxaca decomposition method. Daily wage is the dependent variable. The result indicate the components of discrimination is larger than the endowment component. This explains the discrimination exists against informal workers in the Indian Labour Market.

Sheikh & Gaurav (2020) focuses in the determinants of informal employment, where education, training and gender are the major factors. It was found that informal job holders had low educational qualifications. The informal job's chances were reduced with education. Educated youth are less likely to be employed in the informal job. Furthermore, those with formal vocational training were less likely to engage in the informal employment. Females are less likely to participate in informal work, raises questions about the provision of critical services such as maternity and childcare support in informal jobs.

Berniell, Berniell, De la Mata, Edo and Marchionni (2021) estimated the short- and long-run labour market impacts of parenthood in a developing country, Chile, based on an event-study approach around the birth of the first child. They found that becoming a mother implies a sharp decline in employment, working hours, and labor earnings, while fathers' outcomes remain unaffected. Importantly, the birth of the first child also produces a strong increase in labour informality among working mothers (38%). All these impacts are milder for highly educated women. The reasons behind these effects are: (i) informal jobs' flexible working hours prevent some women from leaving the labour market upon motherhood, (ii) improving the quality of social protection of formal jobs tempers this increase in informality. The results suggest that mothers find the flexibility needed for family-work balance in the informal job.

The paper investigates the drivers of wage inequality within education groups in Central-Eastern European Countries by employing EU-SILC micro data before (2007) and after (2012) the crisis. The main focus is on the variability of temporary/permanent workers wage gap and on the role of institutions (labour market deregulation, union density, and wage coordination) in shaping the gap across education groups and along the wage distribution. Results, obtained by means of OLS and quantile regression methods, confirm that holding a temporary position corresponds to a statistically significant negative wage gap with respect to permanent jobs, especially for low-paid jobs and tertiary educated workers. The impact of institutional settings on the wage gap varies remarkably across education groups and wage levels, and strongly depends on the macroeconomic conditions (Perugini & Pompei, 2017).

The paper investigates the gender wage gap among recently graduates, controlling for job and academic variables and for the field of study, as women lag behind in highly remunerative majors. The raw gender differential in hourly wages is 5.6%. Using quantile decomposition, the paper shows that the unexplained gap increases along the wage distribution, indicating a glass ceiling effect. Heterogeneities arise among fields of study: the largest total gap emerges in Law, Political-Social Sciences, and Economics-Statistics. In most disciplines, there is a significant unexplained gap from 3.3% (Medicine), to 8.7% (Law), up to 9.6% (Agriculture) which constitutes the largest share of the difference, confirming that most of the wage gap remains

unexplained also by major. Finally, geographical differences is used to explore the influence of institutional and macro-economic variables, as well as of attitudes towards gender norms. The results indicate that childcare and part-time employment availability are correlated with lower gender wage gaps, while traditional gender norms are associated with higher differentials (Piazzalunga, 2018).

Beręsewicz and Nikulin (2018) in their study shows a strong relationship between the probability of informal work and age, sex and labour force status. They find that unemployed, economically inactive, younger people, lower educational level or engaged in part-time work are more likely to take up an informal job. Moreover, men are more likely to work informally than women, in each age cohort. Interestingly, people from medium-sized towns have a higher propensity for informal work, which is at the lowest in rural areas. For the young and poor educated people, the opportunities in the legal labour market are limited, they may be more inclined to look for alternatives in the informal market. In less developed sub-regions, where the self-employment is more prevalent and the share of long-term unemployed is greater, the probability of taking informal job is higher. The results show that unemployed people are more likely to work informally. So, unemployment leads to informal employment. Therefore, a proper policy reducing unemployment may bring significant results in the decrease of informal work.

Hussain (2019) studies on 'Street vending' in Dhaka, Bangladesh, the most common urban informal sector of the city. After the engagement of the street vending activities they face series of problems such as harassment, eviction, confiscation and sometimes forced to provide goods in undervalued prices and so on. Without finding any other sources of subsistence as well as their livelihood they are going through the process of vulnerabilities and sometimes with negotiation. Thus, street vending is the result of the failure of the neoliberal state to create formal employment opportunities for the emerging population. It's the duty of the government to fulfill their demand and include them in the main stream of the society to save them from marginal condition of living.

2.4 Conclusion

Informal employment is defined 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" (ILO, 2003). To reiterate, the government, state owned enterprises, corporations, I/NGO, etc. registered with relevant authority are formal sector, if not, the private farms or business and others are considered as informal sector. The farm or other business unincorporated, no accounts maintained, not registered the business at national level, provides employment to employees in five or less in number without social security contribution, at non-fixed premises are included in the informal sector. Informal employment by employment status constitutes employees, contributing to family workers, employers and own account workers.

The several studies has been conducted regarding the topic informal employment, and the wage differential in an economics field. But, mostly the research is on the determinants of informality such as age, gender, marital status, education, training, employment status, and mode of payment. Such research is very less in the context of Nepal. The recent NLFS's 2017/18 data is used for the analysis of informal employment in Nepal.

Some of the methodologies used in the papers are Quantile regression (Nezhyvenko, 2018), Logit model (Aikaeli and Mkenda, 2014) and Probit model (Rukundo, 2015) and Mincer model (Nezhyvenko, 2018), for the analysis of determinants of informal employment and wage differential. However, the details of the methodology used in this thesis is explained in the next chapter.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides the research methodology's insights, with the sources and nature of data, nature of the variable, estimation strategy and test statistics for the determinants and wage differential of informal employment in Nepal. The thesis is based on the descriptive, quantitative and qualitative research design, conducted with the secondary sources of data from the Central Bureau of Statistics (CBS) under the National Planning Commission (NPC). The data is extracted from NLFS 2017/18, the latest national level household surveys regarding formal and informal employment information in Nepal.

3.2 Sources and Nature of Data

The study is based on the secondary data, collected from the Central Bureau of Statistics (CBS). Central Bureau of Statistics conducts the Nepal Labour Force survey (NLFS) under the National Planning Commission (NPC). Out of three nationally representative labour surveys (NLFS I (1998/99), NLFS II (2008) and NLFS III (2017/18), and data available, this research work is based on NLFS-III; recent micro-data, a cross-sectional data, which contains formal and the informal-employment related information.

NLFS III questionnaire's is based, NLFS II guidelines, developed on the basis ILO recommendation, and expanded to 168 questions in fourteen sections. The issues, such as short-term returnees, volunteer work, and forced survey situation in the nation are addressed, along with the data on general household information, current activities, current working hour, usual working hour, unemployment, past employment, absentees and work activities of children aged five and above.

The questionnaire's first section contains the housing information, such as ownership of dwelling, the house's structure, drinking water sources, type of toilet, the primary fuel of cooking and, own land of HH or others. The second section covers the household composition like age, sex, ethnicity, relationship, marital status (10+), citizenship and month lived here. The third section constitutes the main paid job/business activity, whether it be agriculture, and business income for all the

household members. The fourth section covers the characteristics of the main paid job/business activity, such as occupation, employment status, contract type, and agreement (temporary or permanent). The fifth section consists of working hours for HH members (10+), total hours of work usually, working hours of seven days, why less than 40 hours, the additional work etc. The sixth section comprises employment-related income that includes mode of payment, the amount received, annual paid amount etc. followed by the seventh section with job search and availability (10+), such as the person seek job/business, how they seek, seek what job, how long seek for job, and reason for not available of job. The eighth section covers the past employment experience (10+), consists worked pay/profit, the reason for leaving job/business, description or work, occupation, status, industry work duration and dependent on what income. The ninth section relates the goods produced for households or family use, like farm work, tent animals or livestock, fishing, hunting etc. The tenth section is related to service produce for own-use, such as unpaid housework, yard work, home maintenance, family assistance, looking for family children etc. The eleventh section comprises volunteer followed by the twelfth section with absentees information. The thirteen section constitutes the returnees and short-term migrant workers. Lastly, the fourteenth section provides forced labour's information (CBS, 2017).

3.3 Sources and Nature of the Variable

The dependent variable for the informality determinants is informal employment that takes the value one, if the worker is employed in the informal sector and zero otherwise. The explanatory variables are age, gender, education level, marital status, ethnicity, HH-size, male-headed household, own- land-ownership and the wealth quintile. Likewise, daily wage or the hourly wage is the dependent variable for wage differential and the explanatory variables for it, are same as above except the informal employment.

The NLFS 2017/18's questionnaire is the source of the variables, where section D focuses on the characteristics of the principal paid job/business activity, the informal employment criteria. The descriptions of the variable sources is explained below:

Table 3. 1: Informal employment data sources from NLFS Question

S.N	Code in NLFS Question	Description
1.	D08	employer contributions to workers for social security on his/her behalf
2.	D13	worker's main activity carried out
3.	D14	type of enterprise/business where workers work
4.	D15	business registration with relevant authority
5.	D16	maintenance of books of accounts by business
6.	D17	number of persons, including the owner, in work place

Age, gender, education level, marital status, ethnicity, HH-size, male-headed household, own-land-owner and the **wealth quintile** are the independent variables for Logit regression. Likewise, **wage** is the dependent variable of the multiple regression model. The independent variables are similar to above except informal employment. The details are explained below.

3.4 Estimation Strategy

There are two estimation strategies used for the computation of determinants of informal employment and wage differential in the informal employment. The dependent variable is binary, which takes '1' if the worker is employed in informal sector and '0' otherwise. Therefore, the Logit model is estimated (Gujarati, Porter & Gunasekar, 2012). The major explanatory variables are age, gender, education level, marital status, ethnicity, HH-size, male-headed household, own-land-owner and the wealth quintile. The two phase of weighted Logit regression is conducted, where the gender variable that take one for male and otherwise is replaced with male-headed household, as they perfectly correlate to each other.

The equation is defined in terms of log odd ratio as:

$$L_i = Ln\left[\frac{P_i}{1-P_i}\right. = \beta_1 + \beta_2 X_i + u_i$$

where, Ln is the natural logarithm, P_i is the probability to participate in informal employment, X_i is a set of explanatory variables as defined above, β_i are constant parameters and u_i is individually and identically distributed error terms.

Bandara (2018) used the binominal Logistic regression analysis for the determinants of informal youth employment The research was based on secondary data, a micro-data, collected by the Department of Census and Statistics for Annual Labor Force Survey 2011. The survey includes rich information on demographic characteristics, education, occupation, and industry for all employed persons, information on the size of the production unit, earnings, and hours of work is available only for employees. Therefore, the descriptive analysis was done to find extend, nature, and distribution of youth's informal employment in the southern province.

The basic estimation strategy to determine the wage differential of informal employment is shown below as:

$$Wage_i = \beta_0 + \beta_1 \text{informal employment} + \beta_2 age + \beta_3 ethnicity + \beta_4 marital\ status + \beta_5 education\ level + \beta_6 HHsize + \beta_7 maleheaded\ household + \beta_8 own\ land\ owner + \beta_9 wealth\ quintile + \varepsilon_i$$

The dependent variable, informal employment, is coded as inf_emp1, where one is informal employment and zero otherwise. The dummy variable of the different independent variables is generated. The gender variable male1 signifies, one is for male and 0 for female. The ilo_age, the variable, represents the working age population from 15 to 65. In, ethnicity dummy variables, such as Brahmin, Chhetri and Thakuri, All Janajati, All Dalit and Others represents eth_bct1, eth_jjati1, eth_dalit1 and eth_others1 respectively. For marital status, ms_nm1, ms_m1 and ms_single codes represents not married, married and single respectively. Similarly, urban1, eduLevel, hhh_male1, hhsize, and own land owner symbolizes urban-rural, education level, male-household head, household size and the own land owner. In case of wage differential, h_wage and d_wage represents the hourly and daily wage which is the dependent variable and one of the independent variable is informal employment (inf_emp1) and rest of the independent variables are same as defined above.

Section A, NLFS's 2017/18, the questionnaire provides the housing information. There are eight questions from A01 to A08. Thus, the table below shows the housing information from NLFS Question to determine PCA and the wealth quintile of workers. Hence, this information provides the worker's wealth information.

Table 3. 2: Housing information from NLFS Question for PCA and wealth quintile

S.N	Code in NLFS Question	Description
1.	A01	house occupied by the household, such as owned, rented, institutional and others
2.	A02	the structure of the house
3.	A03	the main source of drinking water
4.	A04	main type of fuel used for cooking
5.	A05	main source of lighting in the household
6.	A06	type of toilet facilities used by the household
7.	A07	household's facilities information, such as radio, TV, computer, internet and other electric appliances
8.	A08	any agricultural land operated by themselves, or operate land owned by others information.

Since, there are no income-related variables in the questionnaire, so wealth-related index is generated from section A's information for the determinants and wage differential of informal employment in Nepal. Therefore, PCA method is used for generating the wealth quintile of the workers. Principal Component Analysis (PCA) is a dimensionality-reduction method that reduces the dimensionality of large data sets by transforming many variables into a smaller one that includes most of the overall information data. Thus, it creates new uncorrelated variables that successively maximize variance (Jolliffe & Cadima, 2016). The wealth quintile generated are wq1, wq2, wq3, wq4 and wq5 from poor to rich. wq1 represents the wealth quintile of the poor workers, while wq5 of the richest one.

The NLFS 2017/18, section F, the questionnaire provides the main job's employment-related income. The details of it are explained in the table next page:

Table 3. 3: Wage data sources from NLFS Question

SN.	Code in NLFS Questions	Description	Generated Variables	Conversion of wage into hourly and daily
1.	F01b	basic of payment: daily, weekly, monthly or piece rate	x1 = wage received in daily basis x2 = wage received weekly basis and x3 = wage received in monthly basis hc_wage = hourly wage dc_wage = daily wage h_wage = hourly wage in cash and kind d_wage = daily wage in cash and kind	hc_wage= x1/8+ x2/48+ x3/200 dc_wage= x1+ x2/6+ x3/25 h_wage = (F04-F06)/(300*8=2400) d_wage = (F04-F06)/300
2.	F01c	amount of wage received by workers		
3.	F03	employer's goods/facilities at free in subsidized rate, like housing, food, transportation, clothing or others.		
4.	F04	the cost of products, if they have purchased		
5.	F05	annual amount (Rs.) paid to receive such goods/facilities		

The variables x1, x2 and x3 for daily, weekly and monthly wages are generated. Then hourly wage (h_wage) in cash is generated, converting daily, weekly and monthly payment basis into hours by dividing with 8 hours for daily, (8*6=48) for weekly, and (8*25=200) for monthly respectively.

i.e. hc_wage= x1/8+ x2/48+ x3/200

Similarly, daily wage (d_wage) in cash is generated, converting weekly into daily (x2/6) and monthly into daily (x3/25).

i.e. dc_wage= x1+ x2/6+ x3/25

Likewise, goods/facilities are provided to workers in kind too as per question, F04 and certain payment has done by workers for it, which is stated in question F06. Daily and hourly wage are generated by subtracting F06 from F04 and dividing it by (300*8=2400) for hourly wage and by 300 for daily wage. Now, in order to generate daily wage (d_wage) and hourly wage (h_wage) both cash and kind on daily and hourly basis are summed up. This finally gives the total d_wage and h_wage. Thus, we conducted the weighted multiple regression with this dependent variable, wage (hourly or daily) and those independent variables as stated above by using software STATA.

3.4.1 Descriptive Analysis

The thesis's descriptive analysis, provides the worker's informal employment information by age, gender, ethnicity, marital status, education, urban-rural, wage, hhsize, male-headed household, own land ownership, and the wealth quintile. Hence, this information is represented through tables. The dependent and the independent variables for the determinants and wage differential in informal employment in Nepal are stated below:

Table 3. 4: Dependent and independent variables

Dependent Variable	Independent Variables
Informal Employment (inf_emp1)	age, gender, education level, marital status, ethnicity, HH-size, male-headed household, own-land-owner and the wealth quintile
Hourly wage/Daily wage (h_wage/d_wage)	informal employment, age, gender, education level, marital status, ethnicity, HH-size, male-headed household, own-land-owner and the wealth quintile.

3.5 Test Statistics

When the assumptions of OLS, such as assumptions of no perfect multicollinearity, homoscedasticity and no autocorrelation are violated, it gives rise to perfect multicollinearity, heteroscedasticity and autocorrelation respectively. So, we conducted different tests on the data for the detection and removal if any. The results would not be trustworthy, resulting in error or over or underestimation of significance, if those OLS assumptions are not met.

In this thesis, we have conducted different tests for the detection of multicollinearity, autocorrelation and heteroscedasticity present in the regression model based on Gujarati, Porter and Gunasekar (2012). Therefore, the tests and removal methods are explained below:

3.5.1 Autocorrelation Test

If there is relationship between error term of current time period and the previous time period, it is called autocorrelation. One period of time has great effect on another period of time. So, error term in two different period of time are closely related with each other.

i.e. $E(u_i, u_j) \neq 0$

Thus, Durbin-Watson (DW) test is used to detect the autocorrelation present in the model.

If there is no autocorrelation, $\rho=0$ and $d=2$

If $\rho=1$, $d=0$, we accept that there is perfect autocorrelation and for positive correlation, it will be stronger as the d is closer to zero.

If $\rho=-1$, $d=4$, we have perfect negative autocorrelation.

Therefore, if $2<d<4$, there is some degree of negative correlation, which is stronger when d is closer to 4.

3.5.2 Multicollinearity Test

The presence of linear relationship among the explanatory variables of the regression model is called multicollinearity. Variance Inflation Factor (VIF) test is conducted for the detection of multicollinearity present in the model.

Generally, VIF= $\frac{1}{1-R_j^2}$, where R_j^2 is the R^2 from the regression of X_j on other regressors.

As R_j^2=1, VIF=∞

As R_j^2= 0, VIF=1

Rule of Thumb: VIF>10, there is high multicollinearity and would consider for remedial measures.

Generally, a VIF near to one suggests, there is no multicollinearity, whereas a VIF near 5 might require concern.

3.5.3 Heteroscedasticity Test

When all the disturbance terms do not have the same variance, it is known as heteroscedasticity. In other words, if the variance of error term is not constant for all the observation, it is called heteroscedasticity.

i.e. Var(u) ≠ σ^2

Breush-Pagan Godfrey test is used to detect the presence of heteroscedasticity in the model.

where, H_0: constant variance

H_1: presence of heteroscedasticity

If p<0.05, we reject H_0. This means there is presence of heteroscedasticity.

3.5.3 Omitted Variable Bias Test

When we leave some important variables from regression model, the output would not come to the point which is known as omitted variable bias. In this case, omitted variable bias test is conducted for the detection of biasness of variable in the model.

where, H_0: there is no misspecification bias in the regression model

H_1: there is misspecification bias in the regression model

If p<0.05, we reject H_0. This means there is misspecification bias in the regression model.

3.6 Conclusion

The informal employment is dependent variable for informal employment's determinants, and the independent variables are gender, age, marital status, ethnicity, education level, HH-size, male household head, own land owner and the wealth quintile of the workers. The Logit regression model is conducted. The wage in daily and hourly basis is dependent variable, in the case of wage differential in the informal employment and informal employment, age, ethnicity, marital status, education level, HH-size, male household head, own land owner and the worker's wealth quintile are

the independent variables. The multiple regression is conducted for this. The different tests are conducted to detection of multicollinearity, autocorrelation and heteroscedasticity present in the regression model. Thus, the data analysis and discussions on the determinants and wage differential in Nepal's informal employment in Nepal, and its findings are explained in the next chapter.

CHAPTER IV

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter delivers the data analysis in the informal employment determinants and wage differential of informal employment in Nepal, from NLFS's 2017/18 data as defined in earlier chapter, its presentation, and the discussions. The proportion of employment and the employment by age, gender, education, ethnicity, urban-rural, wage, marital status, HH-size, male-headed household, own-land ownership are presented in the table. The Logit and the multiple regression model is conducted for the informal employment's determinants and the wage differential in the informal employment in Nepal respectively. The data are analyzed using the software Stata, and hence, the results are interpreted.

The sample in the study is nationally representative. The sample size of NLFS, the national level data is 18,000, while it is reduced in this thesis. This is due to removal of the missing values present in the variables. The results from the descriptive statistics of variables used are nearly close to NLFS's. So, the sample can be nationally represented. The details of this chapter is shown below:

Table 4. 1: Proportion of employment

	Freq.	Percent
Formal Employment	2,425	14.44
Informal	14,367	85.56
Employment	16,792	100.00
Total		

Source: Researcher's calculation

The informal employment, calculated from the data of NLFS 2017/18, is 85.56 percent, while formal employment is 14.44 percent. This shows the informal employment holds the largest share in the Nepalese economy.

Table 4. 2: Employment by gender

Variables	Male	Female	Total
Informal	8,768	5,599	14,367
	82.26	91.29	85.56
Formal	1,891	534	2,425
	17.74	8.71	14.44
Total	10,659	6,133	16,792
	100.00	100.00	100.00

Source: Researcher's calculation; figures in parenthesis are in percentage

The above table is employment by gender. Male workers are more into informal employment than female workers. There are 8,768 and 5,599 numbers of male and female workers in the informal job in Nepal. Likewise, 1,891 male and 534 female are engaged in the formal employment. Some gender disparities are observed, where the share of those in informal employment is higher among females than males (91.29 percent compared to 82.26 percent).

Table 4. 3: Employment by age

Variables	Age				
	15-24	25-54	55-64	65+	Total
Informal	3,023	9,730	1,127	487	14,367
	95.51	82.58	85.83	91.71	85.56
Formal	142	2,053	186	44	2,425
	4.72	17.33	18.15	0.00	14.44
Total	3,165	11,783	1,313	531	16,792
	100.00	100.00	100.00	100.00	100.00

Source: Researcher's calculation; figures in parenthesis are in percentage

The informal employment is highest among the youth aged 15-24 years, at 95.51 percent. This proportion increased with age and is at lowest among those aged 25-54 years at 81.85 percent. This means people are more likely to work in informal job with their increase in age.

Table 4. 4: Employment by ethnicity

Variables	Brahmin*	Janajati	Dalit	Others	Total
Informal	4,374	5,928	3,153	912	14,367
	77.87	88.49	91.58	88.29	85.56
Formal	1,243	771	290	121	2,425
	22.13	11.51	8.42	11.71	14.44
Total	5,617	6,699	3,443	1,033	16,792
	100.00	100.00	100.00	100.00	100.00

*Source: Researcher's calculation; * is Brahmin, Chhetri and Thakuri; figures in parenthesis are in percentage*

Table 4.4 illustrates that informal employment is highest among Dalit workers, at 91.58 percent, followed by Janajati, Others and Brahmin, Chhetri and Thakuri at 88.49 percent, 88.29 percent and 77.87 percent respectively. In formal employment, Brahmin, Chhetri and Thakuri are more than other ethnicity group.

Table 4. 5: Employment by marital status

Variables	Never married	Married	Single*	Total
Informal	2,205	11,676	486	14,367
	92.22	84.13	92.93	85.56
Formal	186	2,202	37	2,425
	7.78	15.87	70.76	14.44
Total	2,391	13,878	523	16,792
	100.00	100.00	100.00	100.00

*Source: Researcher's calculation; * represent single widow, separate and divorced; figures in parenthesis are in percentage*

The above table illustrates that singles (92.93%) are more into informal employment than never married (92.22%) and married workers (84.13%). Married workers are highly engaged in formal employment among all.

Table 4. 6: Employment by education level

Variables	No schooling	Primary	Secondary	Tertiary	Total
Informal	4,176	5,106	4,263	822	14,367
	96.27	90.77	78.18	59.74	85.56
Formal	162	519	1,190	554	2,425
	3.73	9.23	21.82	40.26	14.44
Total	4,338	5,625	5,453	1,376	16,792
	100.00	100.00	100.00	100.00	100.00

Source: Researcher's calculation; figures in parenthesis are in percentage

Education level is classified into no schooling, primary, secondary and tertiary. Worker's in the informal employment with no education, primary, secondary and tertiary are 96.27 percent, 90.77 percent, 78.18 percent and 59.74 respectively. This depicts less educated are involved in informal jobs. The more, the education attainment, the more they involve in the formal employment.

Table 4. 7: Employment by locality

Variables	Urban	Rural	Total
Informal	6,671	7,696	14,367
	80.67	90.30	85.56
Formal	1,598	827	2,425
	19.33	9.70	14.44
Total	8,269	8,523	16.792
	100.00	100.00	100.00

Source: Researcher's calculation; figures in parenthesis are in percentage

There are 7,696 workers in informal employment in rural area, while it is 6,671 in

urban. Informal employment is higher among rural dwellers (99.30%) than among urban dwellers (80.67%). In contrast, formal workers are higher in urban than rural.

Table 4. 8: Employment by household head

Variables	Male-headed	Female-headed	Total
Informal	5,237	9,130	14,367
	79.53	89.45	85.56
Formal	1,348	1,077	2,425
	20.47	10.55	14.44
Total	6,585	10,207	16,792
	100.00	100.00	100.00

Source: Researcher's calculation; figures in parenthesis are in percentage

The workers in female headed household (89.45%) are engaged more in informal employment than male-headed household (79.53%). In contrary, male-headed household's workers are higher in formal employment.

Table 4. 9: Summary of daily/hourly wage

	Obs.	Mean	Std. Dev.	Min	Max
Daily wage	8221	657.7069	404.9901	1.666667	11,800
Hourly wage	8221	82.2133	50.6238	0.2083333	1,475

Source: Researcher's calculation

The table is daily/hourly wage summary. The minimum daily wage earned is Rs. 1.67, whereas the maximum daily wage is Rs. 11,800. Similarly, the minimum hourly wage earned is Rs. 0.21, whereas the maximum hourly wage is Rs. 1,475.

4.2 Determinants of Informal Employment in Nepal

The informal employment determinants are the factors that affects the informal employment in Nepal. The dependent variable of the Logit regression model is the informal employment, a binary variable, that takes a value one if the worker is employed in the informal sector and zero otherwise. The major explanatory variables are worker's demographic characteristics, such as gender, age, ethnicity, marital status, education level, household size, male-headed household and the economic variables are worker's wealth quintile and own-land-ownership.

The descriptions of variables in the regression model along with the coefficient and expected signs are expressed based on the research paper; Rukundo (2015), Aikaeli

and Mkenda (2014), Angel-Urdinola and Tanabe (2012), Kouadio and Gakpa (2020), Nezhyvenko (2018) and Parajuli (2014) is shown below:

Table 4. 10: Description of variables and the coefficient's expected signs

Dependent Variable: Informal Employment (inf_emp1)			
Dependent Variables			
S. N	Code	Description	Coefficient and expected signs
1.	male1	gender which takes one if male and zero otherwise	β_1(+)
2.	age	working age workers of age 15 to 65	β_2(-)
3.	eth_bct1	worker's which takes one if Brahmin, Chhetri and Thakuri and zero otherwise	β_3(-)
4.	eth_jjati1	worker's ethnicity where Janajati is one and zero otherwise	β_4(+)
5.	eth_dalit1	Worker's ethnicity where Dalit is one and zero otherwise	β_5(+)
6.	others1	worker's ethnicity where others is one and zero otherwise	β_6(+)
7.	ms_m1	worker's marital status where one is married and zero otherwise	β_7(+)
8.	urban1	urban-rural where urban is one and zero is rural	β_8(-)
9.	eduLevel1	education level of the workers	β_9(-)
10.	hhsize	household size of the workers	β_{10}(+)
11.	hhh_male1	household head of the family which takes one if male and zero otherwise	β_{11}(-)
12.	own_land_own	own land cultivated by worker	β_{12}(-)
13.	wealth	workers wealth quintile from poorer (wq1) to richest (wq5)	–

At first, the informal employment variable is generated from section D, the NLFS's questionnaire. Informal employment is based on the enterprize registration, enterprize type, employment's nature, employment's condition and types of employment. If the enterprize is an incorporated company (D14), registered with relevant authority (D15), and the main activity is in the government, state-owned enterprize and the international org/foreign embassy, it is considered the informal employment. The enterprize type, includes private, government, non-government and the households. The status of job are employees, employers, own-account, unpaid family workers and others. Thus, economy has formal sector, informal sector and the households. The condition of employment are social security, paid annual leave, and paid sick leave.

The workers with the facilities of social security, annual leave and sick leave and the job status is employer, own-account workers, unpaid family workers, and employed in the informal sector and the households, it is considered the informal employment. The descriptive statistics of the variables used in the model are shown below:

Table 4. 11: Descriptive statistics of the variables

Variables	Obs.	Mean	Std. Dev	Variance	Min	Max
inf_emp1	16,792	0.8556	0.3515	0.1236	0	1
male1	77,638	0.4635	0.4987	0.2487	0	1
age	77,638	28.0343	20.4019	416.2374	0	105
eth_jjati1	77,638	0.3636	0.4810	0.2314	0	1
eth_dalit1	77,638	0.2092	0.4066	0.1654	0	1
ms_m1	61,717	0.6213	0.4851	0.2353	0	1
eduLevel1	77,638	2.3098	1.2289	1.5104	1	5
hhsize	77,638	5.3909	2.6418	7.0125	1	27
hhh_male1	77,638	0.1608	0.3674	0.1350	0	1
own_land_own	77,638	1.8173	0.3864	0.1493	1	2
Wq1	77,638	0.1626	0.3690	0.1362	0	1
Wq2	61,167	0.1939	0.3954	0.1563	0	1
Wq3	61,167	0.2112	0.4082	0.1666	0	1
Wq4	61,167	0.1908	0.3929	0.1544	0	1
Wq5	61,167	0.1976	0.3982	0.1585	0	1

Source: Researcher's calculation

The table above shows the descriptive statistics of the variables used in the regression model. The mean worker employed informal employment is 85.56 percent followed by male worker with 46.35 percent. The average age of the worker is 28 while 36.36 percent and 20.92 percent are the Janajati and Dalit workers respectively. The average married workers are 62.13 percent. Most of the workers pursue the primary education level. The average male headed workers are 16.08 percent and the household size is 5. 1.82 average workers own their own land. The other summary statistics, such as standard deviation, variance, minimum and maximum are presented in the above Table 4.15.

The different independent variable's dummies are generated as mentioned above. The wealth- related variable is generated from Section A, NLFS III's questionnaire, which is stated in Table 3.2. These all variables are combined with the PCA method, where large dimensional variables are reduced to small, uncorrelated and information are preserved with maximum variance. The wealth quantile dummy thus generated are wq1, wq2, wq3, wq4 and wq5 from wq1 being poor workers to richest one wq5. Thus, both dependent and independent variables are regressed by Logit regression model. The result obtained from STATA, version 12 is shown in the following table:

Table 4. 12: Logit regression results and the odd ratios of the coefficients

	(1)	(2)	(1)	(2)
Variables	inf_emp1	inf_emp1	odds ratio	odds ratio
male1	-0.636***	-	0.530	-
	(0.100)		(0.0531)	
age	-0.000475***	-0.000438***	1.000	1.000
	(4.72e-05)	(4.87e-05)	(4.72e-05)	(4.87e-05)
eth_jjati1	0.190**	0.187**	1.209	1.206
	(0.0949)	(0.0946)	(0.115)	(0.114)
eth_dalit1	0.435***	0.432***	1.545	1.540
	(0.137)	(0.136)	(0.212)	(0.209)
ms_m1	-0.583***	-0.453***	0.558	0.636
	(0.140)	(0.143)	(0.0782)	(0.0906)
eduLevel1	-0.865***	-0.880***	0.421	0.415
	(0.0530)	(0.0526)	(0.0223)	(0.0218)
hhsize	0.0392**	0.00339	1.040	1.003
	(0.0200)	(0.0199)	(0.0208)	(0.0200)
own_land_own	-0.114	-0.113	0.893	0.893
	(0.0920)	(0.0918)	(0.0821)	(0.0820)
wq1	1.851***	1.888***	6.363	6.607
	(0.214)	(0.213)	(1.360)	(1.410)

wq2	1.368***	1.383***	3.929	3.989
	(0.153)	(0.153)	(0.600)	(0.609)
wq3	1.052***	1.064***	2.862	2.898
	(0.155)	(0.154)	(0.443)	(0.446)
wq4	0.683***	0.686***	1.980	1.985
	(0.108)	(0.108)	(0.213)	(0.215)
hhh_male1	-	-0.645***	-	0.525
	-	(0.0924)	-	(0.0485)
Constant	4.826***	4.720***	124.7	112.1
	(0.329)	(0.326)	(41.00)	(36.57)
R- squared	20.95	20.95	20.85	20.95
Observations	11,273	11,273	11,273	11,273

Source: Researcher's calculation Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In above Table 4.16, all the independent variables except own-land-owner on the dependent variable, are statistically significant. That means, there is a relationship between dependent and the independent variables. The variables age, male1, ilo_age, ms_m1, EduLevel1 and have a negative impact on the informal employment, whereas variables eth_jjati1, eth_dalit1, hhsize, wq1, wq2, wq3, wq4 have positive impact at 1% and 5% significance level. The coefficient of male1 tells, being male is negatively related to the probability of having informal jobs than female. Likewise, as the age of workers increases, the probability of being in informal employment goes down. Both, the eth_jjati1 and eth_dalit1 coefficients are positive. That means, both the Janajati and Dalit workers are more into the informal employment than Brahmin, Chhetri and Thakuri and others. But, the married workers are less likely to work in informal employment than others. As the level of education goes up, on an average, the worker's probability, being in informal employment goes down. Likewise, the coefficient of hhsize is 0.0392, indicates, the more, the size of household, the more probability working in the informal employment. All the worker's wealth quintile

variables are statistically significant. wq1 being the poorest one, likes working more (1.859), and wq4 being the richest one, comparatively prefer to work less in the informal employment (0.683).

The hhh_male1 variable is replaced instead of male1, as they perfectly correlate to each other. The male-headed household works less in the informal sector than female. The other variable's result shows, the same results like above. R^2 is 20.95 percent and 20.85 percent which is satisfactory in case of cross-sectional data. The LR Chi2 test shows the regression model is statistically highly significant as p-value is less than 0.05.

The results of the odd ratio coefficients is explained here. For the coefficient, male1, odd ratio is 0.530, and it is statistically insignificant as $p>0.05$. The male worker has less probability to be employed in informality than female. An increase in age of the worker by one unit, implies probability of being employed in informal job decrease. Being Dalit, increases the probability of being employed in the informal sector in comparison to the non-Dalit. Similarly, the married worker's probability of engaging in informality is less than others. It may be due to the increased responsibility of the family after marriage. The education level's result depicts, higher the years of schooling, there is less probability of being employed in the informal sector. An worker's HH-size increase by one unit, implies probability of being employed in informal job also increases. The wq1, being the poorest worker's wealth quintile, there is more probability to be employed in the informal sector, whereas wq4 being the richest worker's wealth quintile, there is relatively less percent probability to engage in the informal sector. Poor are more into informality than rich one. The male-headed household has lower probability to be employed in informality than female.

4.3 Wage Differential among Formal and Informal Employment

The dependent and independent variables of the regression model details is mentioned in the previous chapter in Table 3.4. The regression model's, dependent and the independent variables along with the coefficient and the expected signs based on Ben Yahmed (2018), Herrera-Idarraga, Lopez-Bazo and Motellon (2015), Parajuli (2014), Quiroga-Martínez and Fernández-Vázquez (2021), Villanueva and Lin (2020) and Yamamoto and Kaneko (2017) are expressed below:

Table 4. 13: Description of the variables and the coefficient's expected signs

Dependent Variables: Worker's daily wage (d_wage) and hourly wage (h_wage)			
Independent Variables			
S.N.	Code	Description	Coefficient and expected signs
1.	inf_emp1	gender of workers where male is one and female is otherwise	β_1(-)
2.	age	working age workers of age 15 to 65	β_2(-)
3.	eth_jjati1	worker's ethnicity where Janajati is one and zero otherwise	β_3(+)
4.	eth_dalit1	Worker's ethnicity where Dalit is one and zero otherwise	β_4(+)
5.	ms_m1	Worker's marital status where one is married and zero otherwise	β_5(+)
6.	eduLevel1	education level of the workers	β_6(+)
7.	hhsize	household size of the workers	β_7(+)
8.	hhh_male1	household head of the family where one is if male and zero otherwise	β_8(+)
9.	own_land_own	own land cultivated by worker	β_{12}(+)
10.	wealth	worker's wealth quintile from poorer (wq1) to richest (wq5)	-

The wage variable is generated from the Section F, NLFS's questionnaire. The sources of generated variables and the conversion of wage into daily and hourly wage is presented in the table in the previous chapter in Table 3.3. The multiple regression is conducted using above dependent and the independent variables. Thus, the result obtained from STATA, version 12 is shown below:

Table 4. 14: Multiple regression results

Variables	(1) d_wage	(2) h_wage
inf_emp1	-340.2***	-42.52***
	(29.91)	(3.739)
age	0.0407***	0.00508***
	(0.00821)	(0.00103)
eth_jjati1	12.21	1.527
	(17.26)	(2.158)
eth_dalit1	-36.20**	-4.524**
	(14.76)	(1.845)

ms_m1	59.02***	7.377***
	(17.60)	(2.200)
eduLevel1	122.9***	15.36***
	(9.113)	(1.139)
Hhsize	3.129	0.391
	(2.661)	(0.333)
hhh_male1	133.8***	16.72***
	(15.87)	(1.984)
own_land_own	48.74***	6.092***
	(14.20)	(1.775)
wq1	-28.37	-3.546
	(21.83)	(2.729)
wq2	-40.44**	-5.055**
	(20.15)	(2.519)
wq3	-62.58***	-7.823***
	(20.11)	(2.513)
wq4	-48.74***	-6.092***
	(18.78)	(2.347)
Constant	457.2***	57.15***
	(53.14)	(6.642)
Observations	5,731	5,731
R-squared	0.280	0.280

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Researcher's calculation

The Table 4.18 is the multiple regression model's results. The variables inf_emp1, ilo_age, eth_dalit1, ms_m1, EduLevel1, hhh_male1, own_land_own, wq1, wq2, wq3, and wq4 are statistically significant at 1% and 5% significance level. It means, they have impact on dependent variable. But, eth_jjati1 and hhsize are statistically insignificant. The worker's in the informal employment earn less daily wage than in formal employment by Rs.340.20. So, there is a negative relationship between informal employment and the daily wage. As the age of workers increases by 1 unit,

the daily wage of that worker also increase by Rs.4.07. The eth_daliti1 workers has probability of earning high daily wage by Rs. 36.20. The married workers tend to earn high daily wage than others by Rs.59.02. The education coefficient suggests, the average daily wages increases by about Rs.122.90 for every additional year of education, ceteris paribus. The hhsize and daily wage has no relationship with the informal employment. When there is a male-headed household in the family, the daily wage also increases by Rs.133.80 than female-headed. The worker's with own-land ownership has probability to earn more daily wage by Rs.48.70. All the wage quintile are negatively significant with daily wage except wq1. The poorer workers wq2 earns less daily wage by Rs.40.44 which increases in wq3 by Rs.63.58 and again decreases in wq4 by Rs.48.74. The F-test is statistically significant as the p-value is less than 0.05. R^2 is 28 percent, means 28 percent of the variation in dependent variable is explained by variation in the dependent variables.

In case of the hourly wage, inf_emp1, ilo_age, eth_jjati1, ms_m1, EduLevel1, hhh_male1, own_land_own, wq1, wq2, wq3 and wq4 are statistically significant, whereas hhsize and eth_dalit1 are statistically insignificant. There is positive relationship between hourly wage and the informal employment. The informal employment coefficient is -42.52 means, holding all other variables constant, the average hourly wage of informal workers is lower than the average formal hourly wage by about Rs.42.52. The Dalit workers earns more hourly wage by Rs.3.445. Married worker's hourly wage earning increases by Rs.4.524 than others. The education coefficient suggests, the average hourly wages increases by about Rs.15.36 for every additional year of education, ceteris paribus. The male-headed household's hourly wage increases by Rs.16.72 than the female-headed. The workers who acquire own-land, the hourly wage increases by Rs.6.092 The more, the rich worker, their hourly wage also decreases as the coefficient of wq4 is Rs.6.092, while wq2 earns the hourly wage by Rs.5.055. The F-test is statistically significant as the p-value is less than 0.05. R^2 is 28 percent, means 28 percent of the variation in dependent variable is explained by variation in the independent variables.

CHAPTER V
SUMMARY OF FINDINGS AND CONCLUSIONS

5.1 Summary of Findings

The dependent variable is informal employment, and gender, age, Janajati, Dalit, marital status, education level, hhsize, own-land own and wealth quintile are the independent variables for the informal employment determinants. The male workers are less likely to work in the informal employment than female as there is a negative relationship between male workers and the informality. As the age of workers goes on increasing, they are less likely to be in informal employment. But, Janajati and Dalit workers tend to work more in the informal jobs. The married workers is negatively significant to the informal employment. The higher the level of education by individuals, the lower probability to be employed in the informal job. The result also indicates that as the family size increases, there is more chances of being employed in the informal job. The workers who own and operate their own land are unassociated with the informal employment. The poorer the workers are, the more they are likely to involve in the informal employment. The male-headed household has significantly negative impact on the informality, means male-headed household tend to engage less into the informal employment than female. The regression model has overall goodness of fit for cross-sectional data set.

The first multiple regression is between the dependent variable, daily wage and independent variables; informal employment, age, Janajati, Dalit, marital status, education level, hhsize, male-headed household, own-land ownership and the wealth quintile. The informal employment has negatively significant effect on the daily wage. The workers involved in the informal employment earns less daily wage than in the formal employment. The result shows, there is positively significant association between worker's age and the daily wage. The more the age of workers, the more they are likely to earn daily wage. The worker's daily wage rises when the workers are from Dalit ethnicity. But there is no significant impact of Janajati workers on worker's the daily wage. Married workers are more likely to earn higher daily wage than others. So, they are positively linked with each other. The result also indicated that as the worker's education level goes on increasing, their daily wage also increases. So,

there is positive association between daily wage and the worker's education level. There is a no association between family size and the daily wage. The male-headed household tend to earn more daily wage than others. The workers with own land is more likely to earn more daily wage as there is lower significant between own land and daily wage. All the wealth quintile are negatively significant with the daily wage. The poorer the workers, they earn less daily wage than the richer one.

Hourly wage is dependent variable, in this case and independent variables are same as mentioned above. Like in daily wage, there is significant negative relationship between informal employment and hourly wage. This indicates, the workers engaged in the informal employment are less likely to earn hourly wage. The interesting finding is that daily wage earning is higher relatively to hourly wage. Like in daily wage, the worker's age increases, their hourly wage also increases. There is a positively significant impact of Dalit workers on hourly wage but no association between Janajati workers and the hourly wage. Married workers are more likely to earn the hourly. Similarly, the more the worker's education attainment, the more probability to earn the hourly wage. But, no association between family size and the hourly wage. The male-headed households are more likely to earn hourly wage. The workers with own land tend to earn higher hourly wage. The poorer workers are less likely to earn hourly wages than that of richer ones. The overall regression model is statistically significant.

5.2 Conclusion

This thesis aimed to examine determinants of informal employment and wage differential of informal employment in Nepal. The Logit regression model and multiple regression are conducted for this respectively. Gender, age, marital status, ethnicity, education level, HH-size, male-headed household and the worker's wealth quintile influence the informal employment in Nepal. Male workers are less exposed to informal employment than female. As the age of people goes on increasing, they are less likely to work in informality. It may be because as the person's age increase, they shift to secure job in the formal sector. Lower the age, higher chance to incline in the informal job. On the ethnicity basis, Janajati and Dalit are the vulnerable group, so they tend to be more in informal jobs. Likewise, married workers are less likely to be in informal as they want secure job to support the family members. Educated people

are more into formal jobs rather than informal. This predicts that the firms are motivated to pay low wages to the workers on the daily basis. The informal employment acts as a last resort for the poor individuals with less education to earn a living in a country like Nepal. The larger the family size, the more involvement in the informal employment. It may be due to the more family members, the more income is required to support the family need. Workers acquiring own land is unlinked with informal employment. Similarly, male-headed households are supposed to involve less in informal employment. In Nepal, most of the household head are male and they work in the formal sector as there is no security for the informal jobs. The poorer workers have higher probability to incline in informal employment than richer ones. Poor people suffer from the poverty, so they are compelled to work in informal sector to survive and fulfill their basic needs. Thus, workers with Janajati and Dalit ethnicity, female workers, larger household size and the poorer workers participates more in informal employment while male workers, the more the age, married, workers with higher education level, male household and richest person are less exposed to informal employment.

There is a wage differential among formal and informal employment. It is the major informal employment consequence. The people in the informal employment are less likely to earn daily and hourly wage than in formal employment. But while comparing the both daily and hourly wage, the workers earn more wage hourly than daily. There is more wage income in informal employment than formal one. The formal sector recruit the educated workers with experience and the social security contributions are also facilitated. So, in early age people are more into informal employment and with increase in age they shift towards formal sector as the wage in formal sector is higher than informal ones. People with increase in age, Dalit, married workers, higher education level, male-headed household, workers with own land and poorer one earn more daily and hourly wage. Thus, there is lower wage earning in informal employment than formal employment.

In Nepal, most of the informal jobs are unobserved. About 84.60 percent of workers are engaged in the informal employment. However, many of them are still unrecorded and unobserved. So, a serious attention is must at the national level. The factors such as gender, age, marital status, ethnicity, education level, household size, wealth status

of the people are to be considered while formulating any policies. Improved policies on the education and training should be given emphasis as better education will drive individuals from being informally employed to formal employment. All the workers in the country should be brought within the social security contributions that helps to support them financially and to minimize the poverty and inequality.

5.3 Possible Extensions

This research is mainly for the academic requirement of Master of Arts in Economics. So, it would have been much better if there was adequate resources and time. The comparative parallel study could have been done on the informal employment and the wage differential among formal and informal employment in Nepal from NLFS's data of different time period. It can also be studied on the basis of province wise as country have reached into federal system. There are still possibility of adding more other variables, different test statistics and model for more findings. However, there is always room for the improvement and expansion in the research work.

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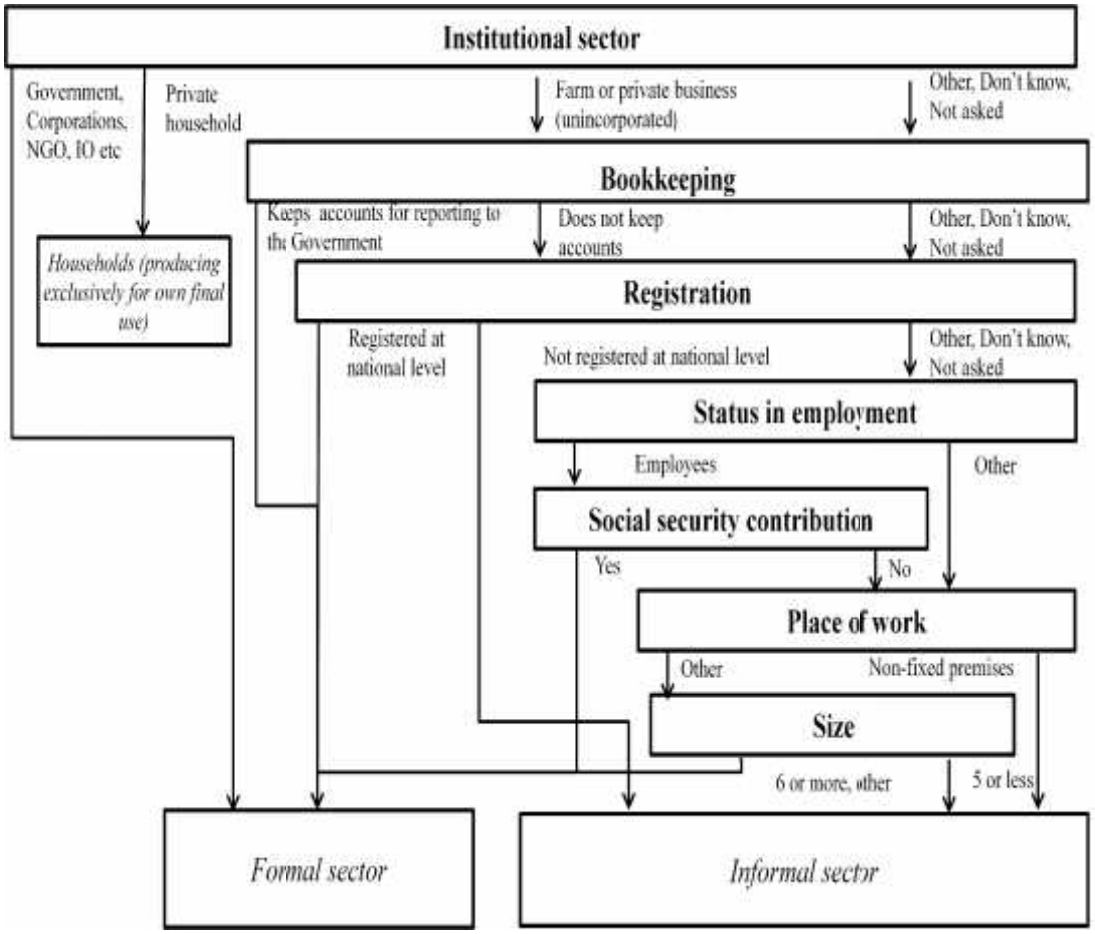
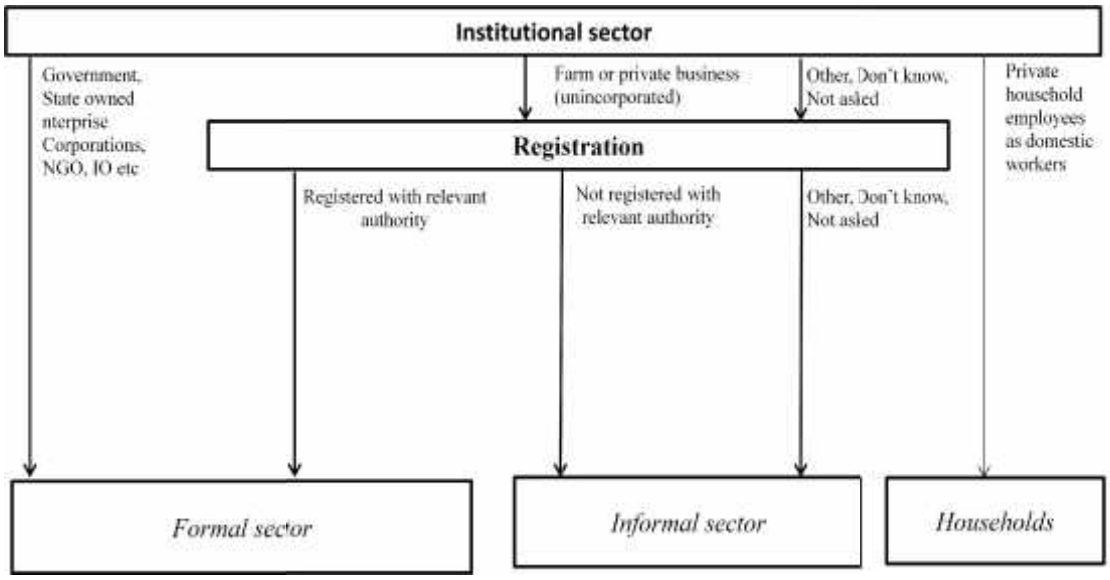
ANNEX

Annex A: A flowchart on the definition of the formal and informal sector



Source: ILO, 2003

Annex B: Informal sector Nepal Flowchart



Annex C: Distribution of the working-age population by sex

Indicator	NLSF 2017/18		NLFS 2008		NLFS 1998/99	
	Male (thousands)	Female (thousands)	Male	Female	Male	Female
Employed	4,446	2,640	5,519	6,259	4,736	4,727
Unemployed	511	397	127	128	98	80
Labor Force	4,958	3,036	5,646	6,385	4,834	4,807
Not in Labor Force	4,250	8,500	783	1,520	527	1,064
Working-age population	9,208	11,537	6,429	7,905	5,361	5,871

Source: NLFS 2017/18

Annex D: Current activity status by locality

Indicator	Urban			Rural		
	Total (thousands)	Male (thousands)	Female (thousands)	Total	Male	Female
Aged 15+	5,950	5,950	7,086	7,452	3,258	4,194
Labor Force	5,541	3,386	2,155	2,453	1,571	882
Employed	4,901	3,043	1,858	2,185	1,403	782
Unemployed	640	343	2,97	2,68	168	100
Outside Labor Force	7,751	2,564	5,188	4,999	1,686	3,313

Source: NLFS 2017/18

Annex E: Number of currently employed and employment-to population rates

Urban-rural	Number of employed (thousands			Employment-to-population aged 15 years and above (Percentage)		
	Total	Male	Female	Total	Male	Female
Nepal	7086	4,446	2,640	35.6	55.6	32.7
Urban	4,901	3,043	1,858	46.2	57.6	35.2
Rural	2,185	1,403	782	35.6	48.3	46.2

Source: NLFS 2017/18

Annex F: Employment by sector

Sector of employment	Male	Female	Total
Total	100	100	100
Formal	40.3	33.5	37.8

Agriculture	1.3	1.2	1.3
Non-agriculture	39.0	32.3	36.5
Informal	59.7	66.5	62.2
Agriculture	13.4	31.8	20.2
Non-agriculture	45.8	32.9	41.0
Private households	0.6	1.8	1.0

Source: NLFS 2017/18

Annex G: Employment by sector and age group

	15-24	25-34	35-44	45-54	55-64	65+	Total
Total	100	100	100	100	100	100	100
Formal	35.0	46.1	40.0	37.2	22.9	15.4	37.8
Agriculture	0.6	1.1	1.8	1.2	1.3	1.9	1.3
Non-agriculture	34.3	44.9	38.2	35.9	21.6	13.5	36.5
Informal	65.0	53.9	60.0	62.8	77.1	84.6	62.2
Agriculture	16.8	13.9	19.0	23.6	34.9	39.3	20.2
Non-agriculture	47.3	39.2	39.8	38.4	41.3	42.4	41.0
Private households	0.9	0.8	1.2	0.8	0.9	2.9	1.0

Source: NLFS 2017/18