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Does Internet Adoption Influence Labour Demand in a Digital World? Empirical Evidence from Nigeria

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Abstract: The study investigated the relationship between internet adoption and labour demand in Nigeria. The General Method of Moment estimation technique was adopted to analyse quarterly secondary data (1999 to 2020) that were gotten from International Labour Statistics (ILOSTAT) database (2020) and world development indicators (2021). The study found that there has been significant increase in internet adoption and a significant decrease in labour demand in Nigeria overtime. Furthermore, internet adoption has a significant positive relationship with labour demand in the agricultural, industrial and services sectors in Nigeria. Meanwhile, institutional quality measured by government effectiveness ensures gender parity in the demand for labour in Nigeria. This implies that if the government of Nigeria is very effective in this discharge of its fundamental responsibilities, labour demand in Nigeria will not be gender biased. The study further asserted that free flow of information via the use of the internet can lead to easy dissemination of information that can aid production and lead to employment.

Keywords: Digital Era, Endogenous Theory, Government Effectiveness, Institutional Quality, Romer's Model

1. INTRODUCTION

The relevance of the adoption of the internet in several economic activities such as labour demand which is the main focus of this study cannot be over emphasized especially in this digital era. However, many reasons have contributed to the incapacity of internet penetration in underdeveloped nations like Nigeria to generate steady increases in labor demand in this digital age. Weak institutional framework is a major contributing factor (Krammer 2016). This is due to the possibility that an inadequate institutional framework may result in improper internet-related policy execution, which will raise labor demand, particularly in developing nations like Nigeria.

Researchers have also discovered that the fast expanding urban labor force as a result of rural-urban migration is another factor. The majority of the time, push-pull factors—such as the pressure brought on by the rural areas' man-land ratio and the severe underemployment that results from the seasonal climate cycle—are used to explain rural-urban migration. This is made worse by a lack of infrastructure, which deters young people from moving to rural areas in search of better opportunities for profitable employment in industry and access to social amenities in cities. Salami (2013) stressed the lack of political will, particularly when it came to enforcing vocational and technical education and vigorously combating corruption. Additionally, seen as one of the main contributors to urban unemployment is rapid population increase.

Meanwhile, the primary focus of this study is the usage trends of the internet in Nigeria. In 2010, the proportion of people using the internet to the total population was 11.5%. Later, in 2015, it increased to 24.5%, denoting a 13.0% rise. In addition, the percentage increased by 9.23% from 25.67% in 2016 to 35% in 2020 between 2016 and 2020 (WDI, 2021). This makes it abundantly evident that the use of the internet appears to have increased significantly and steadily in recent years. On the other hand, it does not appear that Nigeria's labor demand has increased much across all industries. According to ILO data from 2019, the labor demand in the service industry increased by 0.73% in 2000 and 2001 before declining to 0.82% in 2003. Similarly, the demand for labor in the agriculture industry dropped from 48.75% in 2000 to 44.95% in 2005, and then to 36.04% in 2017 and 34.97% in 2019. This suggests that the labor demand in the agricultural sector decreased by 9.98% between 2005 and 2019 and by approximately 3.8% between 2000 and 2005. In the meantime, the labor demand in the industrial sector fell from 12.3% in 2000 to 11.43% in 2005, and then to 10.25% in 2010 and 10.14% in 2011. This suggests that the growth in the demand for labor across sectors has been both astounding and negligible.

By taking into consideration the dynamic impact of internet adoption on sectoral labor demand through the use of a methodological methodology (the General method of moments) that takes endogeneity bias into account, this study adds to the body of current knowledge. The simultaneous bias that develops between internet adoption over time and labor demand, as well as the dynamic effect of internet adoption on labor demand, lead to endogeneity bias. The study aims to examine the impact of previous internet adoption (i.e., internet adoption over time) on current internet adoption and subsequently labor demand through the lens of the dynamic influence of internet adoption on labor demand. Furthermore, a number of research have demonstrated a connection between the past and present usage of the

internet (Farooqi 2020, Rhiel 2014). Furthermore, the study will be conducted at the sectoral level to identify the peculiarities in the nature of labor demand in particular economic sectors. (Sector of services, agriculture, and industry). Furthermore, by examining the impact of internet usage on labor demand by gender in Nigeria, this study contributes to the body of current work. The study examines the effects of internet adoption on male and female labor demand in the services, agriculture, and industrial sectors, respectively, acknowledging that gender disparities impact labor demand. Similar analyses have been conducted by a number of studies in developed economies, including Williams et al. 2019; however, sector-level analysis was not done. In order to investigate how internet adoption affects labor demand when institutional quality is present, the study will also look at how internet adoption interacts with institutional quality. Because the internet can impact sectoral labor demand through its effects on economic growth, it makes sense to include institutional quality into the analysis. However, if economic growth takes place within a weak institutional framework, it may not translate into increased sectoral labor demand.

2. LITERATURE REVIEW

This section xrays the extant literature and reveals the contributions of several authors on internet adoption and labour demand.

2.1. Conceptual Review

2.1.1. Internet Adoption

Internet adoption, in the context of this study, refers to the usage of the internet to facilitate the demand for labour by employers. It is assumed that an increase in the adoption of the internet will facilitate demand for labour and vice versa. This implies that, internet adoption influences demand for labour other things being equal.

2.1.2. Labour Demand

Labour demand is simply the amount of labour that an employer is willing and able to cater for at the prevailing wage rate at a particular point in time.

2.1.3. Institutional Quality

Institutional quality refers to the efficiency of the legal, economic, social and political framework in a society and its effects on issues related to demand for labour. An efficient institutional framework will facilitate optimal employment decisions while an inefficient institutional framework will promote inefficiencies in the demand for labour.

2.1.4. Digitalisation

Digitalization refers to application of digital technology to activities within the economy. In the context of this study, it is the application of internet in the demand for labour that is regarded as digitalization.

2.1.5. Endogenous Growth Theory

Endogenous growth theory is credited to Romer (1986) which describes the application of technology as an input into the process of production. By implication, the Romer's model regards technology as an endogenous variable as against the exogenous models that regard technology as an exogenous variable. In fact, Solow model of exogenous growth regards technology as a residual. The basic distinguishing factor of the Romer's model is that it regards technology as an input in the production process.

2.2. Theoretical Review

2.2.1. Classical Theory of Demand for Labour

The Classical theory of the demand for labour posits that the price of labour (wages) is the major determinant of the demand for labour. Meanwhile, the price of labour is determined by the interaction between the forces of demand and supply of labour. If the supply of labour exceeds the demand for labour, the price of labour drops that is wages fall and by implication there is a decrease in the demand for labour. On the other hand, if the demand for labour exceeds the supply of labour, price of labour that is wages becomes higher, there will be an increase in the demand for labor. Conclusively, higher wages attract a higher demand for labour while lower wages discourage the demand for labour.

2.2.2. Neo Classical Theory of Demand for Labour

In the Neo Classical Theory of Demand for Labour, the major determinant of the demand for labour is consumer preference. This implies that it is the preference an individual has for a job that determines if he or she will be willing to undertake such a job. This theory simply explains the fact that, certain factors aside wages such as good working environment and other benefits can influence the decision of an individual to undertake a job.

2.2.3. Keynesian Theory of Demand for Labour

The Keynesian theory of demand for labour explains that it is the level of economic activity in the economy that determines the demand for labour. This implies that if the level of economic activity is high, there will be an increase in the demand for labour and vice versa. Economic activities in the

context of Keynesian theory include consumption spending, investment spending, government expenditure and net export. Therefore, a change in any of these components that determine the level of economic activity can influence demand for labour

2.3. Empirical Literature Review

Although there is broad consensus that internet adoption greatly increases economic labor demand, there is disagreement on the overall effect of internet adoption on employment and uncertainty about this long-term link (Dachs and Peters, 2022; Biagi and Falk, 2021). This is due to our presumption that employment growth is impacted by ICT innovation uptake after a lag. Different approaches have been taken to this research topic in recent studies on the employment effect of ICT at the firm, sector, and national levels. Scholars working at the company level focus on the potential impact of ICT on employment levels and job quality. Research has shown that ICT adoption can complement and replace corporate organization and decision-making systems, from the perspective of the quantity effect. This can result in increases in labor productivity and the potential to save jobs (Brynjolfsson and McAfee, 2022; Hidalgo, Alonso, Rodríguez, 2020). Firm-level data claim that labor market shifts are influenced by extensive ICT advances, even in situations where total employment remains constant, from the standpoint of the quality effect. ICT developments do, in fact, facilitate knowledge transfer, but they also displace some essential knowledge and skills, creating a polarized labor market (Brynjolfsson and McAfee, 2022). This process of replacing low- and middle-skilled workers with computers and digital technologies is known as skill-biased technical change, and it is the reason behind the shift in labor demand from blue-collar to white-collar jobs.

Meanwhile, a few studies also highlighted the impact that ICT adoption has on the creation of jobs at the sector level. The result is mitigated by the fact that some empirical studies (Muto and Yamano, 2020; Bogliacino and Pianta, 2010; Paunov and Rollo, 2016; Mallick and Sousa, 2017) support the idea that ICT adoption has a consistent positive impact on employment across all sectors, while other studies (Hidalgo Pérez et al., 2016) show an ambiguous relationship across economic sectors with notable differences. Utilizing a recently developed dataset that spans ten European countries from 2002 to 2010, Biagi and Falk (2017) conclude that ICT adoption has no effect on labor demand for the manufacturing or service sectors. It is still challenging to get a consensus regarding which industries stand to gain and which lose from the widespread usage of ICT, despite the growing number of sector-level research studies. The macroeconomic strand of ICT research uses growth accounting and the traditional neoclassical model as major tools to illustrate

how employment is affected by ICT development through a number of transmission channels acting in opposite directions. On the one hand, ICT reduces labor demand and human intervention by substituting computers for routine tasks (Karabarbounis and Neiman, 2014). On the other hand, as a result of increasing income and consumption, cutting costs associated with production, and creating new products and services, innovation and digital technology result in the creation of new jobs (Vivarelli, 2020; Bloom *et al.,* 2022). Therefore, advancements in ICT have an impact on employment in terms of both remuneration and displacement. Consequently, even if total demand is higher, there may be a net decrease in labor demand, which is inadequate to support an increase in employment. In actuality, demand growth must outpace productivity growth in order to generate new jobs.

In summary, it is unclear how employment and internet adoption are related. Labor markets are experiencing fundamental upheaval as a result of information-based technology, which is developing at the same time that it is replacing jobs. Digital technology is displacing humans, who were once considered essential in many industries, such as trade, transportation, art, law, medicine, agriculture, finance, education, management, security, accounting, and consulting. Digital technology essentially consists of computers, networks, and more recent models of mobile phones. The majority of research focuses on this link at the firm level; nonetheless, microeconomic empirical evidence is unable to fully represent the entire influence of ICT on employment and, thus, cannot be applied generally.

3. THEORETICAL FRAMEWORK AND METHODOLOGY

3.1. Theoretical Framework

3.1.1. Romer's model of Endogenous growth theory

The theoretical framework of this study is hinged on endogenous growth theory. Endogenous growth theory is a theory that models economic growth through the medium of technological knowhow. Unlike the neoclassical growth models, technology is regarded as a core determinant of long run economic growth. Hence, technological progress is treated as endogenous and that it is depends on the economic decisions of economic agent. By implication, it is a result of diminishing returns to scale that limits the expansion of output in neoclassical growth model and it is technological progress that bring about increasing returns to scale where a proportionate increase inputs will lead to a more than proportionate increase in outputs. Thus, endogenous theory is not based on competitive equilibrium where factors of production are rewarded according to the value of their marginal products.

The formula for basic production function, according to Romer is as:

$$Y_i = AK_i^a L_i^{1-a} K^b$$

Where AK_i^a is capital, L_i^{1-a} is labour and K^b is technical progress.

3.2. Methodology

3.2.1. Data Sources

The data utilized for this study is quarterly secondary data (1999 to 2019) from international labour statistics (ILOSTAT) database (2020) and world development indicators (2021). The World Development Indicators is a compilation of relevant, high-quality, and internationally comparable statistics about global development and the fight against poverty.

3.2.2. Econometric Specifications

In order to examine the effects of internet adoption on labour demand across sectors, equation 1 is estimated.

$$LSLD_t = \beta_0 + \beta_1 LIA_{t-1} + \beta_2 LGDP_t + \beta_3 INF_t + \beta_4 LPI_t + \beta_5 LINST_t IA_{t-1} + e_t \quad (1)$$

Where LIA_{t-1} = log of Past Internet adoption

LGDP = Log of Gross domestic product

INF = inflation

LPI = Log of private sector investment

$INSTIA_{t-1}$ = Institutional quality (government effectiveness) interacted with log of past internet adoption

LSLD = Log of Sectoral labour demand

The rationale behind the adoption of the GMM estimation technique is to account for the endogeneity bias that may arise between dynamic effect of internet adoption (IA_{t-1}) and sectoral labour demand. Dynamic effect of internet adoption simply means internet adoption overtime and this implies that there is a relationship between internet adoption in the past and current adoption of internet. It is expected that there will be a positive relationship between the dynamic effect of internet and Sectoral labour demand. This is because if internet adoption in the past, will translate to more of internet adoption in the present which in turn lead to increase in sectoral labour demand. This is a novel contribution of this study

In addition, in order to examine the effects of internet adoption labour demand with respect to gender, equation 2 is estimated.

$$LGLD_t = \beta_0 + \beta_1 LGDP_t + \beta_2 INF_t + \beta_3 LPI_t + \beta_4 LIA_{t-1} + \beta_5 INSTIA_{t-1} + e_t \quad (2)$$

Where LIA_{t-1} = Log of Past Internet adoption

LGDP = Log of Gross domestic product

INF= inflation

LPI = Log of private sector investment

$INSTLIA_{t-1}$=Institutional quality (government effectiveness) interacted with log of past internet adoption

$LGLD_t$ = Log of Gender labour demand

The rationale behind the adoption of the GMM estimation technique is that endogeneity bias may arise as a result of the interaction between gross domestic product and gender labour demand. Endogeneity bias in this case means gross domestic product influences sectoral labour demand, also, sectoral labour demand can influence gross domestic product. The major difference between model 1 and 2 is that model 2 examines the dynamic effect of internet adoption in the presence of institutional quality on gender labour demand while model 1 examines the dynamic effects of internet adoption on sectoral labour demand in the presence of institutional quality.

Table 1: Table of Variable Description

Variable	Variable description	Source
Internet adoption	Internet users as percent of Population	World bank (2021)
Institutional quality	Government effectiveness	World bank (2021)
Inflation	Percentage changes in price Index	World bank (2021)
Private sector investment	Private sector credit to GDP and broad money as percent of GDP	World bank (2021)
Sectoral labour demand	Sectoral employment	International labour statistics (2020)
labour demand by gender	Sectoral female and male employment	International labour statistics (2020)
Economic growth	Gross domestic product	World bank (2021)

Source: Research Finding.

## 4. RESULTS AND DISCUSSIONS

This section discusses the empirical results from the econometric equations estimated via the GMM estimation technique.

4.1. Trend of internet adoption in Nigeria

There has been significant growth in the number of internet users in Nigeria. For instance, the number of internet users as percent of population was 0.0088% in 1996, it further rose to 0.041% in 1999 and got to 3.45% in 2005. This implies that the number of internet users as percent of population

increased by over about 3.4% from the mid 1990's to mid-2000's. Furthermore, by the year 2010, the figure had risen to as high as 11.5%, it later rose to 24.5% in 2015 and 35.5% in 2020. Based on the foregoing, it is clear that the number of internet users per population increased tremendously in the 2000's.
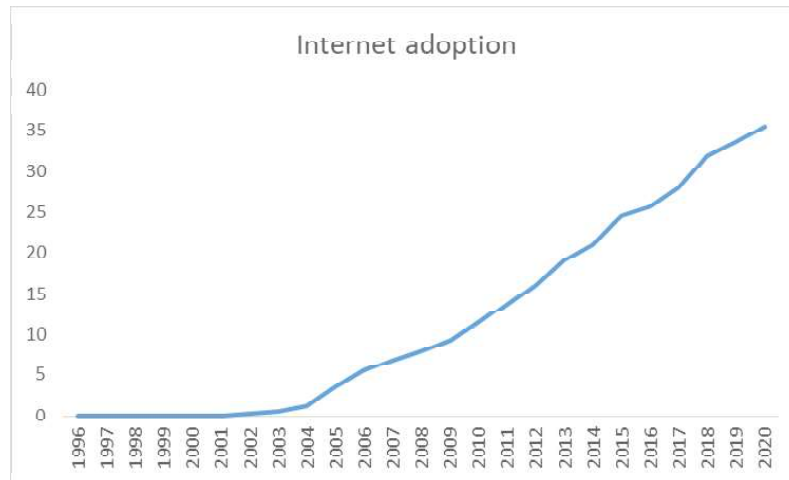

Figure 1: The trend of internet adoption proxied by number of internet users as a percentage of population

Source: Research Finding

4.2. Trend of Agriculture labour demand

The demand for labour in the agricultural sector has been on a steady decline since 1990's. In 1995, the percentage of agricultural sector labour force employment in total employment was 50.18%, it fell to 49.2% in 1999 and further dropped to 44.95% in 2005. This implies that between the mid 1990's and mid 2000's, the percentage of agricultural labour force employment in total employment dropped by about 10%. Meanwhile, the figure later declined to 41.36% in 2010, fell further to 36.93% in 2015 and later on to 34.97% in 2019. This clearly depicts a decline in the demand for labour in the agricultural sector. This is consistent with the findings of Odozi et al (2018), Ajaikaye et al.(2016) and Olomola (2007) that although the agricultural sector is an important source of employment in Nigeria, it has been experiencing a rapid decline in employment share and contribution to GDP since 2001. A plausible explanation for this decline could be the shift of attention of the labour force from agricultural to the oil sector because of the high wages earned in the oil sector. It could also be a result of the failure of the government to provide appropriate funding and adequate

infrastructural facilities that will make agriculture attractive to the labour force.
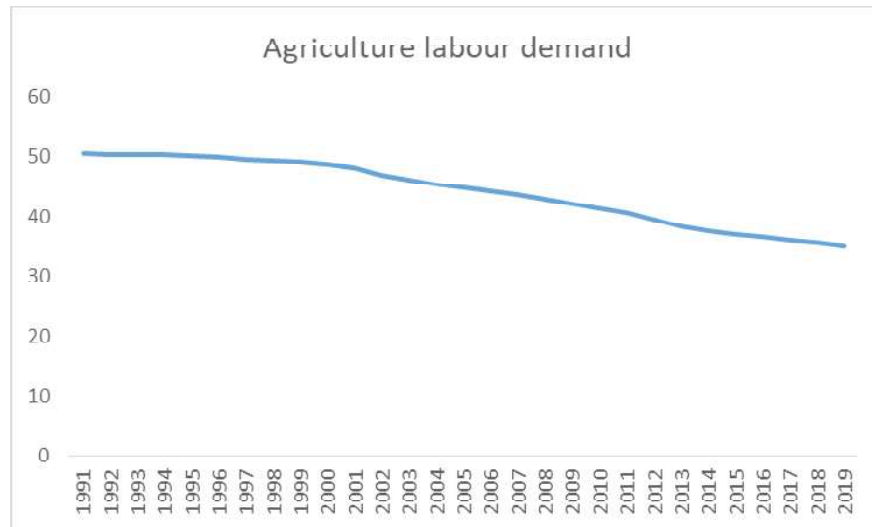
Figure 2: The trend of employment in the agricultural sector as a percentage of total employment in Nigeria

Source: Research Finding

4.3. Trend of Industry labour force

The demand for labour in the industrial sector has also been on the decline since 1990's. This is evident from figure 3 below. The percentage of industrial sector employment in total employment was 13.11% in 1995, it later fell to 12.56% in 1999 and further fell to 11.43% in 2005. Meanwhile, the figure further fell to 10.25% in 2010, 11.93% in 2015 and then slightly rose to 12% in 2019. This clearly indicates that the rate of employment in the industrial sector as a percentage of total employment has been on a steady decline. A plausible explanation for this might be low productivity in this sector which is a result of the infrastructural deficit present in the sector. Infrastructural deficits such as epileptic power supply, bad roads, poor market networks and so on.

4.4. Trend of Services labour force

A critical look at figure 4 reveals that in the services sector, there has been increase in employment as a percentage of total employment. For instance, in 1995, the employment in the services sector as a percentage of total employment was 36.70% in 1995, it later rose slightly to 38.22% in 1999 and further rose to 43.61% in 2005. Afterwards, in 2010, it jumped to 48.38%,

Figure 3: The trend of employment in the industrial sector as a percentage of total employment in Nigeria

Source: Research Finding
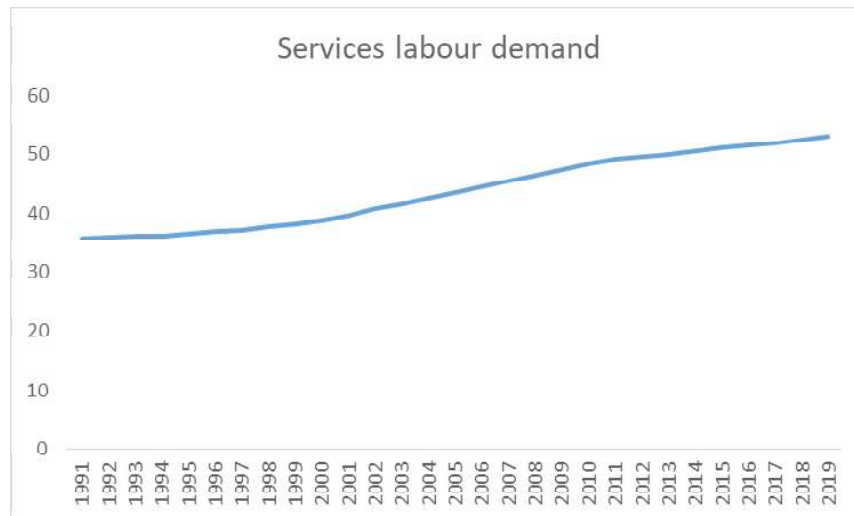
Figure 4: The trend of employment in the services sector as a percentage of total employment in Nigeria.

Source: Research Finding

further increased to 51.11% in 2015 and 53.09% in 2019. Based on the foregoing, it seems that the services sector has been the highest employer of labour in Nigeria since 2010. This is because, in 2010, the services sector

accounted for 48.38% of the total employment and since then has been on the increase while the agricultural sector accounted for 41.36% in the same 2010 and the industrial sector accounted for about 10.25%. It should be noted that while the services sector employment rate has been increasing since 2010, the employment rate of the agricultural and industrial sectors has been on a steady decline thus making the services sector the highest employer of labour in Nigeria.

4.5. Trend analysis of internet adoption and sectoral labour demand in Nigeria

Generally, internet adoption in Nigeria is characterized by significant growth in terms of the number of internet users as percentage of population and mobile cellular subscriptions per 100 people. However, the growth in the adoption of the internet has not succeeded in stimulating labour demand in the services, agricultural and industrial sectors of Nigeria. For instance, according to world development indicator (2021) as shown in the figures above, between 2000 and 2005, number of internet users as a percentage of population increased by 3.44%. It later rose to 8% between 2005 and 2010 and further to 24% between 2010 and 2020. In contrast, growth in sectoral labour demand has been on a downward trend. For instance, labour demand in the agricultural sector was 48.75% in 2000, fell to 47.099% in 2002, further fell to 36.04% in 2017 and even to as much as 34.2% in 2019. In the same vein, labour demand in the industrial sector was 12.35% in 2000, decreased to 12.06% in 2002, further dropped to 12.05% in 2017 and 12% in 2019. However, with regards to the services sector, growth in sectoral labour demand slightly increased. For instance, it was 38% in 2000, it rose to 43% in 2005, 48% in 2010 and also grew to 58% in 2019. (WDI, 2021). This clearly reveals that from the 2000's there has increased growth in the adoption of internet but a retarded growth in sectoral labour demand.

4.6. Effect of internet adoption on sectoral labour demand in Nigeria

The study also conducted a GMM estimation to examine the effect of internet adoption on sectoral labour demand. The results presented in table 1 below reveal that there is a positive and significant relationship between past adoption of internet and sectoral labour demand. However, it should be implicitly noted that there is a positive relationship between past adoption of internet and current adoption of the internet. The reason why past adoption of the internet is used in the model is because the use of the internet involves learning and learning occurs overtime. This means that, the more the use of the internet, the better the understanding of the operations of the internet and, therefore, the more other individuals will adopt the internet.

This then implies that, past adoption of the internet influences current adoption of the internet which then influences sectoral labour demand positively and significantly. Furthermore, gross domestic product exhibits a positive and significant relationship with sectoral labour demand. This implies that an increase in gross domestic product will lead to an increase in sectoral labour demand. A plausible explanation for this is the fact that as gross domestic product increases, the national income of the country increases and therefore the sectors of the economy have enough resources to employ labour.

Meanwhile, inflation was negative and statistically significant in the services sector. However, it was only negative but was statistically significant for the agricultural sector and the industrial sector. This implies that in the services sector, a decrease in inflation will lead to an increase in employment significantly. Furthermore, private domestic investment was significant and positive for all sectors under consideration. This implies that when there is a significant increase in private domestic investment, employment will increase in the agricultural, industrial and services sector. In addition, the adoption of internet in the presence of institutional quality (government effectiveness) was positive and statistically significant. This implies that when there is strong institution (government effectiveness), the effect of internet adoption on employment will be felt more than when the institutions are weak. This is evident in the values coefficient of the variable $INSTIA_{t-1}$ (0.934, 0.811, 0.919) which are higher than the coefficients of the variable IA_{t-1} (0.456, 0.656, 0.551).

Table 2: GMM estimation showing the effect of Internet adoption on labour demand

	LAGLD	LINLD	LSRLD
LIA_{t-1}	0.456***	0.656**	0.551***
	(0.021)	(0.231)	(0.111)
LGDP	0.565***	0.789**	0.414***
	(0.023)	(0.313)	(0.123)
INF	-0.543	0.433	-0.345***
	(0.871)	(0.456)	(0.021)
LPI	0.654***	0.554**	0.789**
	(0.01)	(0.211)	(0.312)
$INSTLIA_{t-1}$	0.934***	0.811**	0.919**
	(0.001)	(0.123)	(0.422)
Constant	2.114***	3.231***	0.567***
	(0.001)	(0.002)	(0.023)

Note: *, **, *** represent 1%, 5% and 10% level of significance respectively

Figures in parenthesis are standard errors

Source: Research Finding

4.7. Effect of internet adoption on labour demand by gender in Nigeria

The study further examines the effect of internet adoption on gender labour demand in Nigeria. The results in table 2 reveals that there is a positive and significant relationship between internet adoption and male employment in the agricultural sector while the relationship between internet adoption and female employment in the agricultural sector in positive and insignificant. The reason might be agriculture is not yet highly mechanized in Nigeria and therefore, employment will be gender biased in favour of males because of the physical strength required. Furthermore, gross domestic product and private domestic investment are positively and statistically related to male employment in the agriculture. This implies that as gross domestic products and private domestic investments increase, male employment increases. Furthermore, the results reveal that a decrease in inflation will lead to a significant increase in male employment. However, when institutional quality is introduced, the result shows that internet adoption influences both female and male employment in the agricultural sector. This implies that with government effectiveness, internet adoption can influence both male and female employment in the agricultural sector because institutions in charge of production and employment in the agricultural sector will be properly regulated and policies will be implemented effectively.

Likewise, in the industrial sector, employment is also tilted towards the male. For instance, internet adoption, gross domestic product and private domestic investment exhibit positive and significant relationship with male employment. A plausible explanation could also be the industrial sector is Nigeria is not highly sophisticated yet in terms of technology rather it is mostly driven by manual or less sophisticated technology. Therefore, there is every tendency that employment will be tilted towards males because physical strength will be much needed production processes. Also, the industrial sectors require the use of sophisticated and heavy equipment which might be better handled by men. However, with the interaction of institutional quality (government effectiveness) and internet adoption, internet adoption influenced both male and female employment because government effectiveness will lead to gender equity in the implementation of employment policies.

Moreover, with regards to the services sector, internet adoption exhibits a positive and statistically significant relationship with both male and female employment. A plausible explanation is that the services sector does not discriminate between gender when demanding for labour. This might be as a result of the fact that less heavy equipment is not used in the services sector. Furthermore, other variables such as gross domestic product and

private domestic investment also positively and significantly both male and female employment. This further reinforces the fact that the services sector is not gender biased in employment. In addition, when institutional quality is introduced, internet adoption further significantly influences both male and female employment and it is evident in their coefficients. For instance, before the introduction of government effectiveness, the coefficient of internet adoption was 0.323 and 0.545 for male and female employment respectively. However, with the introduction of governance, the coefficients increased to 0.898 and 0.591 for male and female employment respectively.

Table 3: Shows the effect of internet adoption on labour demand by gender in various sector

	LAGLD		LINLD		LSRLD	
	Male employment	Female employment	Male employment	Female employment	Male employment	Female employment
LIA_{t-1}	0.531*	5.221	0.334**	0.557	0.323***	0.545**
	(0.201)	(4.121)	(0.111)	(0.422)	(0.012)	(0.200)
LGDP	0.441***	0.422	0.765***	0.676	0.456***	0.561**
	(0.111)	(0.303)	(0.212)	(0.422)	(0.111)	(0.211)
INF	-0.341***	-0.717	0.567	0.437	-0.765**	-0.711**
	(0.002)	(0.645)	(0.618)	(0.423)	(0.312)	(0.231)
LPI	0.282**	0.123	0.456***	0.717**	0.515**	0.444
	(0.114)	(0.345)	(0.123)	(0.311)	(0.123)	(0.321)
$INSTLIA_{t-1}$	0.856**	0.965**	0.966**	0.543**	0.898**	0.591***
	(0.345)	(0.456)	(0.315)	(0.121)	(0.322)	(0.001)
Constant	0.412***	0.554**	0.562**	0.444***	0.231**	0.321**
	(0.111)	(0.212)	(0.222)	(0.111)	(0.100)	(0.112)

Note: *, **, *** represent 1%, 5% and 10% level of significance respectively

         Figures in parenthesis are standard errors

Source: Research Finding

5. SUMMARY OF FINDINGS, CONCLUSIONS AND POLICY RECOMMENDATION

5.1. Summary of finding

The main findings of the study are as follows;

➢ Over the years, there has been significant upward trend in the number of internet users as a percent of population in Nigeria.

➢ Over the years, there has been significant decline in the number of employment in agricultural sector as a percent of total employment

➢ Over the years, there has been significant decline in the number of employment in industrial sector as a percent of total employment

➢ Over the years there has been slight increase in the number of employment in services sector as a percent of total employment.

➢ Gross domestic product, internet adoption, private domestic investment and government effectiveness positively and significantly influences employment in the agricultural and industrial sector. However, inflation was inclusive in the services sector but inflation negatively and significantly influenced employment.

➢ Internet adoption, gross domestic product, inflation, private domestic investment and government effectiveness significantly influence male employment in the agricultural sector while Internet adoption, gross domestic product, private domestic investment and governance influence male employment in the industrial sector and Internet adoption, gross domestic product, inflation, private domestic investment and government effectiveness significantly influence male employment.

➢ Government effectiveness significantly influences female employment in the agricultural sector while government effectiveness and private domestic investment significantly influences female employment in the industrial sector while Internet adoption, gross domestic product, inflation and government effectiveness significantly influences female employment in the services sector.

5.2. Conclusions

The study investigates internet adoption and sectoral labour demand in Nigeria. Specifically, the study identifies the trend of Internet adoption and sectoral (Services, Agricultural and Industrial sectors) labour demand in Nigeria. It further examines how internet adoption influences labour demand and gender labour demand in the Services, Agricultural and Industrial sectors in Nigeria. The study was necessitated by the fact that despite the significant increase in the number of internet users per population, demand for labour was still on a steady decline. The study asserts that free flow of information via the use of the internet can lead to easy dissemination of information that can aid production and thus lead to employment.

Meanwhile, the study adopted both descriptive and econometric analysis on quarterly data gathered from world bank data base and international labour organization. The study found out that internet adoption will significantly increase demand for labour in all sectors of the

economy. The study further found that if there is strong institution (government effectiveness), employment would be created across all sectors without any gender bias.

5.3. Policy recommendation

The study proffers the following policies derived from the main findings of the study.

- The Central bank of Nigeria and the federal government of Nigeria should use monetary and fiscal policies respectively to regulate inflation to its barest minimum since it is clear from the study that a decrease in inflation, other things being equal, will lead to increase in sectoral labour demand.

- The Nigerian communication commission should endeavor internet service providers provide quality services to facilitate free flow of information since it is known that free flow of information can create sensitization and boost productivity and employment.

- Government agencies such as federal character commission and ministry of labour should ensure they implement and regulate employment policies and labour laws in order to avoid gender bias and uphold merit in employment processes.

- The central bank of Nigeria should use monetary policies to regulate interest rates to enable the private sector secure funds for investment purposes. This is because increase in private sector investment will lead to increase in employment in all sectors of the economy.

- The federal government through the central bank of Nigeria should provide loans for agricultural and manufacturing businesses to produce and expand since it is evident from this study that these sectors are experiencing steady decline in labour demand.

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