



Effect of Part-time Employment on Labour Productivity in Nigeria

¹ Wushibba Bako*, ² Samuel Muthoga, & ³ James Maingi

¹ Plateau State University Bokkos, – Nigeria

² & ³ Kenyatta University, Nairobi - Kenya

*Corresponding Author's; E – mail: babswbako@gmail.com; bako.wushiba@plasu.edu.ng

Abstract

The nature of employment all over the world had been changing from conventional full-time pensionable employment to different forms of nonstandard employment such as contract workers, part-time workers, and others. These forms of employment accounted for about 70 percent of employment in the United States and Europe while 40 percent of firms in the World employ some temporary workers. One in every five formal employees in Nigeria in 2018 was a part-time worker whose contribution to productivity needed to be investigated. Data was sourced for eight sectors of the economy (agricultural, mining and quarrying, manufacturing, building and construction, transportation and storage, hotel and accommodation, finance and trade), from the National Bureau of Statistics (NBS). It was analysed using random effects model, and the result revealed that part-time employment had a 47.8 percent positive effect on labour productivity while Capital importation, number of workers, and foreign exchange utilization had negative effect on labour productivity. The study recommends a periodic review of part-time workers' welfare to ensure increased labour productivity and growth in the economy.

Keywords: Economic growth, International Labour Organization (ILO), Labour Productivity, Part-time employment

JEL Classification: O40, J11, J24, J40

Contribution to/Originality Knowledge

Part-time employment's effect on labour productivity had been analysed empirically within the context of advanced Western countries, whose production structure is different from those of developing countries. This paper contributes to knowledge through its analysis of part-time employment's effect on labour productivity in a developing African country

1.0 Introduction

The global economy has been changing and so is the structure and nature of employment. Employment change has been largely from conventional full-time employment to non-standard employment. According to the International Labour Organization (ILO, 2016), this change was brought about through globalization which has interconnected businesses across the world through the global supply chain, growth of services, and shift in manufacturing to developing countries. Other factors according to the ILO were the increased role of women in the labour force, the need for flexibility by workers, the demands of family life, international migration, and technological innovations that have facilitated interconnectedness. Therefore, workers are employed as contract employees, on-call workers, day labourers, temporary help, part-time



workers, independent contractors, and employees with contract companies, agency employees, and other forms of self-employment.

The ILO (2015, 2016) stated that nonstandard employment is common but not limited to the agricultural, construction, and arts sectors. It has spread to the airline and hotel sectors and has remained the dominant form of employment in industrialized countries. This form of employment is common in Europe and America because it contributes to output growth. The flexibility of such jobs allows employers to reduce or cut costs during tough times. It also enables them to incur less cost of hiring and training when recruiting from this pool for permanent employment (Kallenberge et al., 2000).

Nonstandard employment according to the ILO (2015, 2016), accounts for about 70 percent of employment in the United States and Europe and about 40 percent of firms in the world employ some temporary workers. In 2014 about one in five employees in Europe works part-time and over 45 percent of employees in the Netherlands worked part-time. In Indonesia, the number of part-time workers increased from 16.1 percent in 2006 to 22.7 percent in 2014 while in Australia, 32.1 percent were part-time workers in 2014 compared to 26.9 percent in 2000. In Africa, part-time employment was 0.1 percent in Tunisia and about 50 percent in Zimbabwe. In Cameroon, part-time employment in the formal and informal sectors was 16.3 and 83.7 percent respectively. In the Democratic Republic of Congo it was 25.3 and 74.7 percent in both the formal and informal sectors while in Chad, 18.6 and 81.4 percent were part-time workers in the formal and informal sectors respectively. In Nigeria, about one in five formal sector workers is a part-time employee.

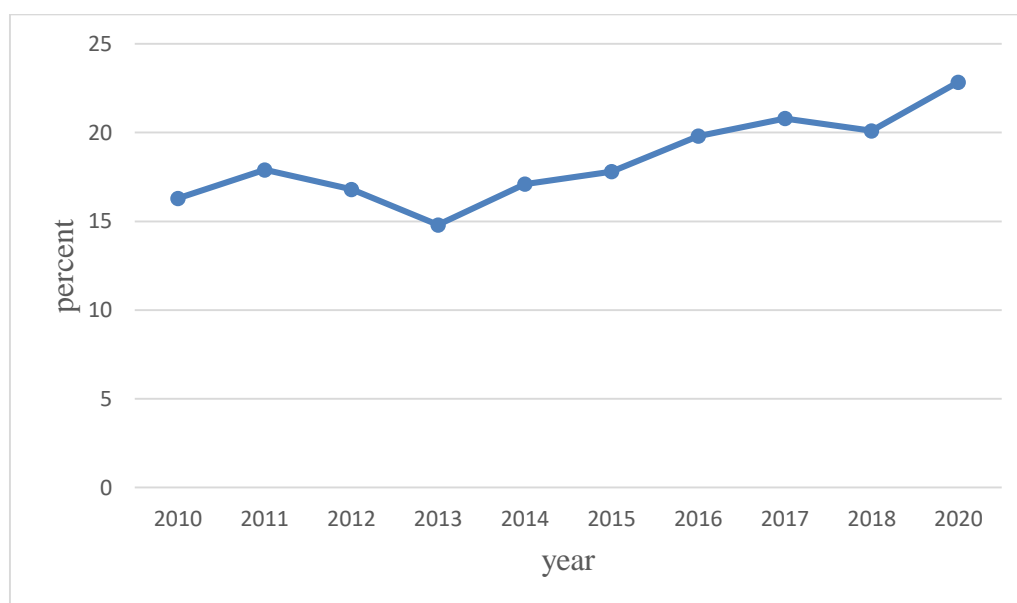
According to the National Bureau of Statistics (NBS, 2019, 2020), major sectors of the economy in Nigeria had mixed growth rates between 2018 and 2020. The agricultural sector which is a major employer of labour grew by 2.12 and 2.36 percent in 2018 and 2019 but decreased to 2.20 and 1.58 percent in the first two quarters of 2020. Manufacturing sector growth was 2.09 and 1.24 percent in 2018 and 2019 but decreased to 0.43 and -8.78 percent in the first two quarters of 2020. The transport sector grew by 13.91 and 10.76 percent in 2018 and 2019 but also decreased to 2.82 and -49.23 percent in the first two quarters of 2020. The construction sector growth rate decreased from 2.33 percent in 2018 to 1.81 percent in 2019. It further decreased to 1.69 and -31.77 percent in the first two quarters of 2020. Trade had negative growth rates of -0.63, -0.38, -2.82, and -16.59 percent in 2018, 2019, and the first two quarters of 2020 respectively. Accommodation grew by 1.76 and 2.85 percent in 2018 and 2019 while in the first and second quarters of 2020 it was -2.99 and -40.19 percent respectively. The financial sector had growth rates of 2.03 percent in 2018 and 2.56 in 2019. It increased to 20.79 in the first quarter of 2020 but decreased to 18.49 percent in the second quarter (NBS, 2019, 2020). In 2021, the annual growth rate of agriculture, manufacturing, mining, and quarrying sectors were 2.13, 3.35, and -7.79 percent respectively while finance, trade, and construction sectors grew by 10.07, 8.62, and 3.09. The growth rate for accommodation, transport, and storage for the same year was -0.45 and 16.25 percent respectively. In 2022, the growth rate declined by 0.25 percent in agriculture from the 2021 figure. In the manufacturing, transport, and storage sectors, the decrease was by 0.9 and 1.05 percent respectively. Trade, mining, and

quarrying sectors also declined to by 3.49 and 10.81 percent respectively in 2022. The financial, accommodation, building, and construction sectors growth rate increased by 6.29, 3.77, and 1.45 percent respectively (NBS, 2021, 2022).

Targeted sectoral growth rates were not achieved in the economy. Between 2017 and 2020, the service sector targeted and realized an average annual growth rate was 2.54 percent and 1.05 percent respectively. In the agricultural sector, the growth rate achieved was 2.62 percent instead of the 6.92 percent that was targeted. The rate of 0.88 percent was realized instead of 4.92 percent in the manufacturing sector. The construction and real estate sector's average annual growth rate was -1.25 percent instead of 5.39 percent while the solid mineral sectors' growth was 3.39 percent instead of 8.54 percent. (Ministry of Budget and National Planning [MBNP], 2017; NBS, 2019, 2020). This implied that expected labour productivity based on sectoral growth targets was not attained.

Between 2009 and 2020 the government implemented Vision 2010, National Economic Empowerment Development Strategy (NEEDS), Vision 20:2020, and the Economic Growth and Recovery Plan (EGRP) for the period 2017-2020. Despite these plans by the government, the attempt to reduce the level of part-time employment was not successful. The government in the EGRP (2017-2020) targeted a part-time employment rate of 17.19 percent in 2017 from 19.8 percent in 2016 but instead, it increased to 20.8 percent. In 2018, the targeted rate was 17.3 percent but the rate achieved was 20.1 percent. The 2020 target is 15.69 percent but 28.16 percent was the realized rate as of the second quarter of 2020. Part-time employment or time-related underemployment had been above 14 percent between 2010 and 2018 as shown in Figure 1.1.

Figure 1. 1: *The trend of Part-time employment in Nigeria.*



Source of Data: NBS Various Issues.



From Figure 1.1, part-time employment increased to 17.9 percent in 2011 from 16.3 percent in 2010. It decreased to 16.8 and 14.8 percent in 2012 and 2013 respectively but increased from 14.8 percent in 2013 to 17.1 and 17.8 percent in 2014 and 2015. It further increased to 19.8 and 20.8 percent in 2016 and 2017 but decreased to 20.1 percent in 2018 and increased to 22.84 percent in 2020. The increase in Part-time employment as shown in Figure 1.1 could be a result of the growth of services in the economy as stated by ILO (2016). The growth rate of services was 3.97, 8.38, and 6.85 percent in 2012, 2013, and 2014 respectively. It was 4.78, -0.82, and -0.91 percent in 2015, 2016, and 2017. In 2018, it was 1.83 percent (NBS,2018). The decline was because in 2014 international price of crude oil decreased and leading to the recession of 2016. According to Burns (2016) despite the possible contribution of part-time employment to output growth in the economy, it is undesirable because of the possible sub-optimal or underutilization of labour and other related resources.

Time-related employment is common in Nigeria and according to Okafor (2012), it is due to the rate of youth unemployment, globalization, and the shift in production from manufacturing to services, the spread of information technology, and the 2005 law which allowed employers to have part-time employees.

This paper sought to investigate how part-time employment affect labor productivity in Nigeria. To achieve this objective, the paper was structured into five sections. Sections one is the introduction while sections two and three are review of literature and methodology. The study result is presented and discussed in section four. Section five concludes the study and makes some policy recommendations.

2.0 Theoretical Literature

According to Barro and Sala-i-Martin (2004), and Romer (1996), the neoclassical growth theory was developed by Solow and Swan in 1956. The theory describes economic growth based on the aggregate production function and the law of motion (Aghion & Howitt, 2009). It is the production function of an economy that determines the level of output in that economy. Output is driven by three major factors based on a simplified production function: labour, capital, and knowledge or effectiveness of labour. Labour and capital are assumed to be rival goods while knowledge is non-rival. Changes in population, labour skills, labour participation rates, and the number of hours worked by labour lead to changes in labour and output over time (Barro & Sala-i-Martin, 2004). Also, changing the level of capital leads to changes in the growth of the economy especially in the short run. In the long run, there will be a permanent increase in GDP per capita when technological improvements result in enhanced labour productivity. Output is produced with a combination of labour, capital, and technology or knowledge using different amounts available at any time. The production function takes the form

$$Y(t) = F(K(t), A(t), L(t)) \quad (1)$$

Where Y is output, K is capital, A is knowledge or effective labour, L is labour and t is time. Dividing Y by L gives labour productivity per worker (the quantity of goods and services produced by each worker) which is the dependent variable used in the study. According to ILO Part-Time Work Convention, 1994 (No. 175) it refers to those who work for fewer hours comparable to fulltime workers and the threshold hours varies from country to country. Part-time workers in Nigeria are those employed for less than 40 hours a week.

2.1 Empirical Literature Review

Kunn-Nelen et al. (2013), did a cross-sectional study of 235 firms in the pharmaceutical sector of the Netherlands in 2007 with a survey and administrative data. The Cobb-Douglas production function was estimated using the ordinary least squares. Output per worker was the dependent variable and work hours of part-time core employees, full-time core employees, and other employees were used as explanatory variables. The study found that there was greater output per worker in firms with a larger share of part-time workers compared to firms with a larger share of full-time workers.

Specchia and Vandenberghe (2013), did a panel study on Belgian firms using matched data from Bel-First and Social Security Registers for the period 2002 to 2009. The study used the Cobb-Douglas production function. Value added per hour, part-time workers, age and share of female workers, blue-collar workers, capital, and the number of employees were variables used in the study. The model was estimated using the fixed effect model with the modification by Akerlberg et al (2006) of ACF-FE to correct for bias. The study found that there was a negative effect on productivity by part-time workers. Productivity fell by 1.3 to 0.7 percent for short and long part-time workers respectively, for an increase of 10 percent in the number of part-time employees. The inverse relationship was also found to depend on the industry considered and the direction of part-time jobs because it may turn positive in sectors where time flexibility matters to cope with demand.

Garnero, Kampelmann, and Rycx (2014), did a panel study of Belgian firms for the period 2009 to 2010 with data from the Structure of Survey and the Structure of Business Survey that was merged by Statistics Belgium using social security numbers. The study used a panel data model and estimated it with difference GMM. Log of value added per hour, full-time, part-time, percentage of women, age, firm size, educational level, sector, managers and professionals, and skill classification were some of the variables used in the study. The study findings reveal that part-timers generate rents for employers with regard to productivity. The positive productivity effect was found to be driven by male part-timers who work for more than 25 hours. A one percentage change in the share of part-timers leads to a 0.08 percentage change in firm productivity.

Nielen and Schiersch (2016), in a study on a variant of part-time (temporary) workers in German plants, used panel data from the IAB Establishment Panel of the Institute for Employment Research for the period 2003 to 2009. The Cobb-Douglas production function was used to underpin the study and the panel model was estimated with system GMM. Gross value added, percentage of females, apprentices, skilled workmen, freelancers, casual, part-



time, and fixed-term employees were variables used in the study. Other variables were legal and organizational framework, dummies for foreign ownership, non-branch plants, and incorporated firms. The study found that most temporary agency workers are used by most plants in Germany as a productivity-enhancing instrument to support their flexibility.

Devicienti, Grinza, and Vannoni (2018), studied Italian firms with data for the period 2000-2010 that was a merged panel data of the Employer-Employee Survey (RIL) of the Institute for Development of Workers Vocational Training and the AIDA from the Bureau Van Dijk. The Cobb-Douglas production function was used to determine total factor productivity (TFP) then a panel data model was estimated using the extended method by Akerlberg et al (2006) to determine the impact of part-time work on firm-level productivity. TFP, part-time share, temporary workers share, age, blue- and white-collar jobs, non-EU workers share, educational level, number of employees, and dummies were used as study variables. The study found that there was a decrease in productivity by 2.3 percent as a result of an increase in one standard deviation in part-time shares. This was a result of horizontal rather than vertical part-time arrangements.

The ILO (2016), stated that nonstandard employment has possible adverse consequences such as; risks to the sustainability of social security, increased labour market volatility, underinvestment in innovation, a slowing of productivity growth, and poor economic performance with other social consequences. Regarding productivity and poor economic performance, there have been positive and negative findings in the literature on the effects of part-time employment. It was found to have positive effects on the productivity per hour of pharmaceutical firms in the Netherlands (Kunn-Nelen et al.,2013). In Belgium, Specchia and Vandenberghe (2013), found that an increase in the number of part-time workers leads to a decrease in the output per worker in firms. While Hirsch and Miller (2012), found negative effects on productivity per worker in plants with about 20 percent of the workers as part-time employees, and positive effects in plants with about 11.3 percent of nonstandard workers in Germany.

3.0 Model Specification.

To achieve this objective, equation 3.16 was used. This was done following Nelen-Kunn et al. (2013) and Mahy et al. (2015) which used panel data models. Given that we have a heterogeneous labour supply in each sector, equation 3.3 was expressed as

$$Y_{it} = A_{it} L_{it}^{\alpha} K_{it}^{\beta} \quad (2)$$

Where Y_{it} is the GDP of sector i in time t in Nigeria, A_{it} is total factor productivity for sector i in time t in Nigeria, L_{it} is the total labour supply in sector i at time t and K_{it} is capital in sector i at time t in Nigeria respectively. Expressing equation 3.10 in productivity and log form

$$\ln[Y / L]_{it} = \ln A_{it} + \alpha \ln L_{it}^* + \beta \ln K_{it} \quad (3)$$

Where L^* is the heterogeneous labour supply in each sector. The adjusted labour quality input will be

$$L_{it}^* = L_{it} \left[1 + \gamma pt \left[PT / L \right]_{it} + \gamma ft \left[FT / L \right]_{it} \right] \quad (4)$$

Where L_{it} is the total number of workers in sector i at time t , $[PT/L]_{it}$ is the proportion of part-time workers in sector i at time t and $[FT/L]_{it}$ is the proportion of full-time workers in sector i at time t . Assuming that the values for $\gamma pt [PT/L]_{it}$ and $\gamma ft [FT/L]_{it}$ are small. Taking the log of equation 3.11 and using $\log[1 + x] = x$ the equation becomes

$$\begin{aligned} \ln L_{it}^* &= \ln L_{it} + \ln[1 + \gamma pt * [PT / L]_{it} + \gamma ft * [FT / L]_{it}] \\ &\approx \ln L + [\gamma pt * [PT / L]_{it} + \gamma ft * [FT / L]_{it}] \end{aligned} \quad (5)$$

Substituting equation 3.3 into equation 3.4 and expressing it in compact form

$$y_{it} = \varphi_{it} + \theta pt_{it} + \sigma ft_{it} + \alpha l_{it} + \beta k_{it} \quad (6)$$

The panel model to be estimated is specified in compact form as follows;

$$y_{it} = \varphi_{it} + \delta x'_{it} + \varepsilon_{it} \quad (7)$$

Where lowercase letters in 3.5 and 3.6 are logs. y_{it} is labour productivity per worker in sector i at time t in Nigeria and x'_{it} is a matrix of explanatory variables in sector i at time t in Nigeria. This includes the number of workers measured in units, capital importation and foreign exchange utilization measured in dollars (USD), the 2015 election dummy, and the proportion of part-time workers. A panel model was used and the choice of random effects was used for the analysis. This was determined by the outcome of the Hausman test. Data was sourced from the National Bureau of Statistics (NBS) of Nigeria.

4.0 Presentation of Result and Discussion of Findings.

Quarterly panel data for eight sectors (agricultural, mining and quarrying, manufacturing, building and construction, transportation and storage, hotel and accommodation, finance, and trade) of the economy identified as priority sectors were used, based on the Vision 20: 2020 and the EGRP for the period 2012 to 2016. Diagnostic tests such as unit roots, variance inflation, and pairwise correlation test, panel random effect test, Hausman test were carried out, and presented in the appendix. The model was estimated using equation 3.7 and the estimated empirical results are presented in Table 4.1.



The estimated result of the random effects model is presented in Table 4.1.

Table 4. 1: Empirical Estimates for the Effect of Part-time Employment on Labour Productivity.

Variables	Random Effects			Fixed Effects		
	Coefficient	Standard Error	P-value	Coefficient	Standard Error	P-value
Labour productivity per worker						
Election	0.004	0.036	0.914	0.005	0.036	0.893
Capital importation	-0.019**	0.007	0.011	-0.020	0.007	0.008***
Number of workers	-0.944***	0.116	0.000	-0.877	0.140	0.000***
Proportion of part-time workers	0.478***	0.120	0.000	0.382	0.143	0.009***
Foreign exchange rate utilization	-0.022*	0.012	0.063	-0.021	0.012	0.082*
Wald Chi2(5)= 76.43	P-value = 0.000				0.000	
Hausman Test	0.636					
R-squared	Within	0.314			0.315	
	Between	0.743			0.719	
	Overall	0.738			0.714	

Note: ***, **, * denote the level of statistical significance at 1 percent, 5 percent, and 10 percent respectively.

Source: Author's computation from study data with STATA 15.

Table 4.1 shows that capital importation had a negative effect on labour productivity and the coefficient was found to be statistically significant. The estimated coefficient was -0.019 and the P-value was 0.011 which was statistically significant at five percent. This means that all things being equal, an average increase in capital importation by one percent will be associated with an average decrease of 0.019 percent in labour productivity. This implies that as capital was imported into the country, labour productivity was reduced. According to the neoclassical growth theory as stated by Solow (1956) fixed technology will result in an inverse relationship between additional labour productivity and capital (Stundziene & Saboniene, 2019). The importation and adoption of new technology require learning, the devotion of more resources to the new capital, and organizational and management restructuring. These changes result in a reduced average level of knowledge and productivity that was below its potential thus leading to a decrease in output growth rate (Hornstein & Krusell, 1996). Less developed countries according to Grossman and Helpman (1991) invest poorly in research and development as such technological progress that facilitates growth and productivity was poor. This finding according to Bruno (1996) was because capital was imported to finance consumption. Agbloyor et. al. (2014) found that in Africa capital inflows had a negative impact on economic growth which implies an adverse effect on productivity. This according to Agbloyor et.al was because foreign capital, flows as investments mainly in natural resources and because it sometimes crowds out domestic investments.

A similar finding was made by Alvarado, Iniguez, and Ponce (2017) where in lower-middle-income countries of Latin America imported capital had a negative effect on economic growth and the coefficient was statistically significant. Samson (2019) also found that in the ECOWAS region capital inflow in the form of FDI had a significant negative impact on growth. This according to Samson was due to inefficient complementary factors like poor investment in

human capital development, weak government structures, and poor level of business infrastructures. Contrary findings were made by Eugene and Jonathan (2016) where capital had a positive effect on the manufacturing productivity of Ghana, Tanzania, and Kenya. Bas and Strauss-Khan (2014) also found that capital importation in France had positive effects on firm-level productivity also Halpern, Koren, and Szeidl (2015) found an increase of about a quarter in the growth of Hungarian productivity due to imported capital inputs.

The proportion of part-time workers had a positive effect on labour productivity and the coefficient was found to be statistically significant. The estimated coefficient was 0.478 and the P-value was 0.000 which was statistically significant at one percent. This result implied that all things being equal, an average increase in the proportion of part-time workers by one percent was associated with a 0.478 percent average increase in labour productivity per worker. It, therefore, means that as more part-time workers were employed, other factors of production were utilized in the economy to facilitate labour productivity. This was because part-time workers according to Houseman (2001) and Nelen et al. (2013) are used during the peak periods of the year such as Christmas and Easter, peak hours of the day or week, and shifts not covered by full-time workers. Increased participation by women in part-time employment and economic recession that is associated with increased part-time employment and their non-trade union membership increase labour productivity (Borowczyk-Martins, 2017; ILO 2016). According to the NBS (2018), from 2016 to 2017 when the economy was in recession, part-time employment increased by 29.2 percent.

This is similar to the findings of Nelen et al. (2013) where it was found that an increase in the share of part-time workers was associated with an increase in labour productivity by 4.8 percent. Also, Garnero et al., (2014) found that an increase in the share of part-timers was associated with an increase in labour productivity but Specchia and Vanderbergehe (2013), found a decrease in labour productivity of between 0.7 and 1.3 percent for long and short part-time workers. Also, Divicient et al. (2015) found a reduction in labour productivity as a result of one standard deviation increase in the part-time share of workers. Ierodiakonou and Stavrou (2015) also found that the use of part-time workers by firms was negatively related to productivity though moderated by employment legislation. The different study findings according to Ierodiakonou and Stavrou (2015) was because of reduced tiredness, stress and the ability of firms to extend operating hours by using part-time workers to increase productivity but also increased administrative costs and other complexities that are associated with different work arrangements adversely affects productivity.

The utilization of foreign exchange had a negative effect on labour productivity. This variable was used to capture the possible effect of naira devaluation on labour productivity. The coefficient was found to be statistically significant at 10 percent. The estimated coefficient value was -0.022 and the P-value was 0.063. The sign was expected because, with the devaluation of the currency, foreign exchange becomes more expensive in local currency and negatively affects its utilization. The finding implied that all things being equal, an average increase in the utilization of foreign exchange by one percent was associated with an average decrease in the labour productivity per worker by 0.022 percent. This means that as the value



of the naira in relation to other world currencies fell, the use of foreign exchange to acquire relevant materials for use by firms in the production of goods and services decreased and therefore resulted in the underutilization of labour and what it can produce. Olatunde and Jacob (2019) in a similar finding, discover that industrial production crumbled in Nigeria because of exchange rate volatility. The existence of the official and parallel markets for foreign exchange had created exchange rate misalignment and made round-tripping profitable for economic actors. This made buying foreign exchange in the official window and its sale in the parallel market more profitable than engaging in production. Which created serious distortions in the economy with a negative effect on the nation's economic growth and its different sectors (Ali et al., 2015).

5.0 Conclusion and Recommendations

The study found that part-time work was statistically significant in explaining labour productivity per worker. It found that an increase in the proportion of part-time workers was positively associated with an increase in labour productivity, all things being equal. Capital importation was found to be negatively associated with labour productivity per worker where an increase in imported capital by one percent was associated with a reduction in labour productivity by less than one percent, all things being equal. The total number of workers and foreign exchange utilization were also found to be negatively associated with labour productivity. An increase in both the total number of workers and foreign exchange utilization was found to be associated with a reduction in labour productivity, all things being equal. The election coefficient was found to be statistically insignificant in affecting labour productivity.

Part-time workers positively contributed to labour productivity in the economy while the total number of workers, capital importation, and foreign exchange utilization were found to have negatively contributed to labour productivity in the economy. The positive contribution of part-time workers to labour productivity was due to the time flexibility and allocation of part-time workers to peak hours of the day and season, less fatigue and stress.

The government should encourage the employment of those that are unemployed as part-time workers and establish a section in the Department of Labour supervision in the Federal Ministry of Labour and Employment that will focus on the needs of part-time workers. The section alongside the Manufacturers Association of Nigeria (MAN), Employers Consultative Forum of Nigeria should meet bi-annually to review the operational business environment in the country, remuneration, education, and training of part-time workers and also provide a productivity innovation fund aimed at part-time workers in the economy. This will motivate innovation, creativity, and increased productivity because long-term labour productivity growth thrives in an environment of investment in human and physical capital, innovation, and quality governance. Workers that are well-educated, better trained, and highly skilled can contribute more to labour productivity by contributing to technological advances and absorption of new technologies including the ones from abroad (Dieppe et al., 2020).

Strikes have had adverse effects on labour productivity because of the loss of man-hours that would have been utilized in the production of goods and services. The government at the federal

level should have regular meetings with the Nigeria Labour Congress (NLC) and the Trade Union Congress (TUC) quarterly to ensure that issues of industrial disharmony are dealt with before they escalate to the level of lockdowns and strikes. The meeting will also be a policy dialogue avenue for the trade unions and government and will eliminate strikes that are a result of policy changes by the government.

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