EFFECT OF PART-TIME EMPLOYMENT AND SKILLS MISMATCH ON LABOR PRODUCTIVITY, UNEMPLOYMENT AND OUTPUT GAP IN NIGERIA

WUSHIBBA BAKO

A Thesis Submitted to the School of Business, Economics and Tourism in Partial Fulfillment of the Requirements for the Award of Degree of Doctor of Philosophy in Economics of Kenyatta University.

November 2022

DECLARATION

This proposal is my original work and has not been presented for an academic award in any other university.
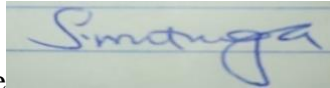
Signature_____ Date__07/11/2022_____

Bako Wushibba

B.Sc, M.Sc Economics (University of Jos)

K96F/CTY/29541/2014

We confirm that the work reported in this proposal was carried out by the candidate under our supervision.

Signature_____ Date___7/11/2022

Dr. Samuel Muthoga

Lecturer

Department of Economic Theory

Kenyatta University

Signature_____   _____ Date 7/11/2022 _____

Dr. James Maingi

Lecturer

Department of Applied Economics

Kenyatta University

DEDICATION

To my wife Nanlop, and our children Wokgam, Nencini and Wokrit.

ACKNOWLEDGEMENT

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ABBREVIATIONS AND ACRONYMS

AU   Africa Union

AfDB   African Development Bank

CBN   Central Bank of Nigeria

CEO   Chief Executive Officer

CMR   Clemente-Montanes-Reyes

EGRP   Economic Recovery and Growth Plan

FMLE   Federal Ministry of Labor and Employment

FGN   Federal Government of Nigeria

FSP   Fiscal Strategy Paper

GDP   Gross Domestic Product

GMM   Generalized Method of Moments

HDI   Human Development Index

HP   Hodrick-Prescott

ILO   International Labor Organization

IMF   International Monetary Fund

ITF   Industrial Training Fund

MBNP   Ministry of Budget and National Planning

MTEF   Medium Term Expenditure Framework

NBS   National Bureau of Statistics

NCE   National Certificate of Education

NDE   National Directorate of Employment

NEEDS   National Economic Empowerment and Development Strategy

NPC   National Productivity Centre

OND   Ordinary National Diploma

UNDP   United Nations Development Program

UNECA   United Nations Economic Commission for Africa

UNESCO   United Nations Educational Scientific and Cultural Organization

USD   United States Dollar

WB   World Bank

OPERATIONAL DEFINITION OF TERMS.

Skills Mismatch: A situation where skills supplied by labor falls short of industry skill requirement in Nigeria.

Part-time employment: This refers to those working in activities that are undertaken for between 20 and 39 hours a week. They are also classified as time-related underemployed or part-time workers.

Unemployment: This is the number of persons who are not engaged in any work and those who work for less than 20 hours a week in Nigeria.

Output gap: This is the difference between the real gross domestic product and potential gross domestic product of Nigeria.

Labor productivity: This is the average amount of output produced by a unit of labor input within a specified period. It is also referred to as output per worker.

ABSTRACT

Skilled manpower development and its effective utilization in the production process is necessary for high economic growth and poverty reduction. This has been the goal of Nigeria which has not been achieved yet despite the establishment of the Industrial Training Fund and the National Directorate of Employment. The nation in 2015 had about 10.5 million children who were out of school, tertiary participation and completion rate of 15 and 13 percent respectively. The mean years of schooling was 5.4 and about 1 in 5 workers was a part-time employee. Labor productivity rate in the country was 57 percent less than the seven fastest developing countries and declined by 5.78 percent between 2015 and 2018 while the unemployment rate was 23 percent in 2018. Economic growth rate was 3.15 as against 6.22 percent policy target for the period 2011 to 2018. These have contributed to criminal activities such as drug abuse, kidnapping, insurgency in the North East, crude oil theft and other socio-economic vices. The purpose of this study is to examine the effect of part-time employment on labor productivity and also determine the effect of skills mismatch on unemployment and output gap in Nigeria for the period 2010 to 2018 using panel and time-series data. Random effects model was used to examine how part-time workers affect labor productivity while the ARDL model was used to determine the effect of skills mismatch on unemployment and output gap. An average increase in part-time workers by 1 percent contributed to labor productivity increase by an average of 0.47 percent while an average increase in capital importation and the number of workers by 1 percent reduced labor productivity by an average of 0.02 and 0.94 percent respectively. It was also found that an average increase of 1 percent in skills mismatch and the number of youths contributed to an increase in unemployment by 13.61 and 2.32 percent respectively but real GDP contributes to unemployment decline by 0.07percent when it increases by an average of 1 percent. The nation's output gap was found to increase by an average of 0.59 percent with an average increase in skills mismatch by 1 percent but reduced by 0.07 and 0.04 percent due to an average increase of 1 percent in capital formation and oil prices. The country should set up a department in the federal ministry of labor and employment that will ensure regular training of part-time workers and improve on their wages. There should also be a committee of the federal government, private sector and institutions of learning at the federal, state and local governments that will review educational curriculum at regular intervals to make skills acquisition in the country relevant to industry demand at the domestic and international level.

CHAPTER ONE
INTRODUCTION

1.1 Background

Low level of unemployment, high output growth and productivity, better skills and literacy rates are desirable goals by countries. Over the years, the World had set various targets and goals to increase the level of literacy and skills, increase global output, reduce poverty and unemployment. These goals include Education for all by the year 2000, and the Millennium Development Goals (MDGs) which aimed at eradicating hunger and poverty, achieve universal primary education, promote gender equality, reduce child mortality, improve maternal health, global partnerships, combat HIV/AIDS, environmental sustainability. These were continued, modified and expanded into seventeen Sustainable Development Goals (SDGs) of no poverty, zero hunger, gender equality, quality education, reduced inequality, decent work and economic growth among others. Between 2000 and 2018, the global literacy rate, unemployment, and productivity growth averaged 83.68, 5.38, and 2.36 percent respectively and the labor underutilization rate (LU3) between 2005 and 2018 was 8.84 percent (World Bank [WB,2020], International Labor Organization [ILO, 2019]).

Through the use of educational and skill acquisition programs such as the 6-3-3-4 system of education, the National Directorate of Employment (NDE), and the Industrial Training Fund (ITF), Nigeria has been working to improve the level of labor skills in the economy. The literacy rate in the country was 67.7 percent in 2015, a decreased from 70.05 percent in 2010. This was because of the insurgency by Boko Haram in the country and high population growth. Federal government budgetary allocation to education was 6.65 and 7.39 percent in 2016 and 2017 which was a decrease from 7.53 percent in 2013. This change was

because of the fall in revenue caused by decrease in the international price of crude oil by 50 percent (BudgiT, 2017; National Bureau of Statistics [NBS], 2018).

According to United Nations Educational, Scientific and Cultural Organization (UNESCO, 2016), there are about 263 million children and youth in the world that are out of school and about 25 million of those at primary school age will never step into classroom. In low income-countries about 14 percent of youth will complete upper secondary education.

The quality of education acquired is as good as the teachers who provide the hands-on-learning. There were acute teacher shortages in about 70 percent of Sub-Saharan African countries and about 90 percent shortage at Secondary School level. The NBS (2018) and BudgiT (2017), stated that the 10.5 million out-of-school children in Nigeria, was the highest globally. In 2014, 67.35 percent of primary school teachers were not qualified to teach. This was because of the increase in demand for education and the high rate of unemployment in the economy. This had contributed to the inadequate development of skilled manpower in the country beginning from primary school. The teacher to pupil ratio was 1:40 in Primary School, 1:50 in Junior Secondary, and 1:26 in Senior Secondary School. These ratios are higher than the 1:10 ratio necessary for effective learning and skill acquisition.

In 2017 about 41 percent of candidates that wrote the West Africa Senior Secondary Certificate Examination did not make the minimum grade of five credits which includes English Language and Mathematics. Institutions of higher learning turned down a lot of applicants for admission into various programs due to inadequate capacity. They could only accept about 29.26 percent (415,500) of

1.42 million students that applied for admission (NBS, 2018). This leaves out over 1 million applicants that were desirous of acquiring tertiary level education and skills.

Part-time employment in Nigeria decreased by 1.19 percent between 2010 and 2013 but increased by 50.64 and 13.62 percent in 2016 and 2018 respectively. Between 2010 and 2018 it increased by 69.10 percent. The policy target between 2017 and 2020 was to reduce part-time employment by 2.21 percent but instead, it increased by 29.61 percent (NBS, 2018, 2020; Ministry of Budget and National Planning [MBNP], 2017). The increase could be because of the fall in the international price of crude oil per barrel that adversely affected the Nigerian economy, the 2016 recession and the effect of COVID-19 lock down measures. It is also because of the 2005 law, high youth unemployment rate and globalization (Okafor,2012). This therefore implies a decrease in the utilization of labor skills and man-hours in the production process.

Unemployment is a global problem that is not desirable because of the adverse economic and social problems associated with it. According to the ILO (2019, 2020) and the NBS (2020), in 2018 and 2019 global unemployment rate was 5.0 and 5.4 percent respectively. This translates to 172.5 and 188 million people and is estimated to increase by about 2.5 million a year. In Africa, the unemployment rate in 2018 and 2019 was 6.9 and 6.8 percent which was about 32.7 and 33.5 million people. The total labor underutilization rate (LU4) for Africa was 22.1 percent in 2018 and 2019 which was 116.6 and 114.6 million Africans. In Sub-Sahara Africa, underutilized labor was about 90.8 and 93.8 million people which was 21.4 and 21.5 percent in 2018 and 2019 respectively. In Nigeria, the unemployment rate in the first, second, and third quarters of 2018 was 21.8

percent or 19.25 million people, 22.7 percent or 20.34 million people, and 23.1 percent or 20.93 million people respectively. It further increased to 27.1 percent or 21.76 million people in the second quarter of 2020. The addition of time-related underemployment leads to a labor underutilization rate of 55.7 percent or 44.7 million Nigerians in the second quarter of 2020.

While unemployment increased, global output growth had decreased between 2017 and 2019. Global output was 3.7 percent in 2017 but decreased to 3.6 and 2.9 percent in 2018 and 2019. In Sub-Sahara Africa, it increased from 2.7 percent in 2017 to 3.0 and 3.1 percent in 2018 and 2019. The growth rate in Nigeria was 0.82 percent in 2017, 1.91, and 2.27 percent in 2018 and 2019 respectively. The increase in Nigeria was due to the recovery in oil prices that fell by about 50 percent (International Monetary Fund [IMF], 2019; NBS, 2019).

According to the NBS (2019, 2020), major sectors of the economy in Nigeria had mixed growth rates between 2018 and 2020. The agricultural sector that is a major employer of labor 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. Human health sector growth was -0.32 in 2018 but increased to 0.31, 1.06, and 1.89 percent in 2019 and quarter one and two of 2020 respectively.

The mining and quarrying sector growth increased between 2018, 2019, and the first quarter of 2020 from 1.11 to 4.43 and 4.58 percent but decreased by -6.60 percent in quarter two of 2020. The construction sector growth rate decreased

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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).

Targeted sectoral growth rates were not achieved in the economy. Between 2017 and 2020, service sector targeted and realized 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 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 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 labor productivity based on sectoral growth targets were not attained.

According to Dieppe and Kindberg-Hanlon (2020), global output per worker declined to 1.4 percent in 2016 from 2.8 percent in 2007 and was less than 2.0 percent a year in 2017 and 2018. The productivity of labor in low-income countries was just 2.0 percent of the growth in advanced economies. Nigeria's change in output per worker according to the United Nations Economic Commission for Africa (UNECA, 2018) and World Bank (WB,2019) was 0.6, 4.8, and -3.8 percent in 2005, 2010, and 2016 respectively. Based on USD

2011(PPP) it was -2.22 percent in 2017 and -0.27 in 2018. Despite the seeming recovery in 2018, the aggregate decline between 2015 and 2018 was about 5.78 percent due to the effect of the fall in the global price of crude oil that started in 2014 and the economic recession of 2016. Education is necessary to change this situation because it is an input to the economic growth path and, an output of economic growth (UNECA, 2010).

The role of skilled labor is critical for innovation, job creation, and the production of goods and services. According to PricewaterhouseCoopers (PwC,2019) about 79 and 87 percent of Global and African Chief Executive Officers (CEOs) were concerned about skilled labor availability for the production of goods and services, and 45 percent of these CEOs are extremely concerned. In the extremely concerned category, 55 and 65 percent of Global and African CEOs identify labor skill inadequacy as contributing to poor innovation while 44 and 54 percent of Global and African CEOs are not able to meet their growth targets due to inadequate skilled manpower. Skill inadequacy was identified by African CEOs as the second most important threat to businesses in Africa, after policy uncertainty. Only four and three percent of Global and African CEOs surveyed had the needed skilled manpower as employees. This has adverse implications for resource utilization, employment, and output growth in Africa and the World.

1.1.1 Policy Landscape

The development of skills for meaningful engagement in the production of goods and services is done basically through a country's formal and informal education system. The First National Development Plan (1962-68) was aimed at increasing the rate of economic growth and generating enough capital for manpower

development. The focus was on generating revenue for the development of the needed manpower that would contribute to rapid economic growth. To achieve these goals government established two paper mills, constructed two dams, a refinery, and the Nigeria Security Printing and Minting Plant. The government also established five universities for the development of high-level skilled manpower between 1960 and 1970. The military coups of 1966 and the eventual civil war that ensued weakened the implementation of the plan. As a result, the economy grew at 5.5 percent annually (Akinbowale, 2018; Peter & Praise, 2016; Iheanacho, 2014; Famerewa, 2014).

The Second National Development Plan (1970-75) was after the Nigeria Civil War which lasted for three years. The plan was anchored on the pillars of reconstruction, rehabilitation, and reintegration that will lead to a just, democratic, egalitarian, and self-reliant nation. Because of the destruction brought about by the war, the policy focus was on rebuilding destroyed infrastructure and national cohesion. To grow the economy and provide employment, destroyed industries were rehabilitated, two salt factories were established, two car assembly plants and the superphosphate project was executed. The indigenization decree of 1972 and the nationalization policy was used to provide jobs and employment opportunities for Nigerians. Colleges of Technology and Trade Centers for skill acquisition were established to develop the needed skilled manpower.

The Third National Development Plan (1975-1980) had a budgeted expenditure of 43.3 billion naira. The plan had identified a reduction in the rate of unemployment and, an increase in the supply of skilled manpower as a major priority. The Universal Primary Education (UPE) program was started in 1976

to improve the level of literacy. About 6.4 million pupils were expected to enroll in 1976 but the number that enrolled was 8.2 million which increased to 9.5 million in 1977. But the planned Secondary and Tertiary School slots were grossly inadequate because as at 1980 the slots were 448,904 and 53,000 respectively. The federal government then established seven new universities to reduce the deficit gap and improve on skill development in the country. The democratic government that came into power in 1979 did not comprehensively implement this plan to the latter but introduced new programs like the agricultural green revolution and austere measures due to oil glut. (Csapo, 1983; Famerewa, 2014).

The Fourth National Development Plan (1981-1985) still identified the need to increase the supply of skilled manpower, increase productivity, and reduce the level of unemployment and underemployment as major priorities. To tackle these problems, the government planned to use oil revenue to enhance the capacity of the economy. According to Famerewa (2014) between 1980 and 1990, the government established nine more universities. Also, agricultural development programs were established in various states of the federation to increase productivity in the economy. But, due to the oil glut of the early 80s and the military coup of 1983, the nation could only attain an annual GDP growth rate of 1.25 percent within this period.

From 1983, the nation adopted the 6-3-3-4 system of education due to the inadequacies of the UPE program to develop skilled manpower at the intermediate and high school level. Despite this, the adult literacy rate was 45.2 percent between 2001 and 2007. It increased to 48.9 percent between 2008 and 2014 and was 62.02 percent in 2018. The per-capita literacy rate increased from

0.55 in 1991 to 0.70 in 2010 and declined to 0.67 and 0.62 in 2015 and 2018 respectively (UNESCO, 2020; NBS, 2016; World Bank, 2020; Macrotrends, 2020). The primary school gross enrolment ratio was 98.2 between 2001 and 2007 but decreased to 94.07 between 2008 and 2014. Despite this enrollment ratio, only 61 percent were able to attain the minimum proficiency level in reading and literature. Most of these pupils end up not enrolling into secondary schools because the secondary gross enrollment ratio was 31.9 between 2001 and 2007 but increased to 44.2 between 2008 and 2014. The mean years of schooling was 5.4 years as of 2015 (United Nations Economic Commission for Africa et al. [UNECA] 2018; NBS, 2016; FMLE, 2017). This reveals the inadequacy of the nation's education and training system to provide graduates with the needed qualifications, knowledge, and skills for employment and effective resource utilization in the economy.

The nation developed Vision 2010 and Vision 20:2020 which was preceded by the National Economic Empowerment and Development Strategy (NEEDS). Vision 20:2020 was focused on seven major objectives. Wealth creation and employment, qualitative and functional education were two of the seven major objectives. Despite the extent of the vision implementation, the nation is still grappling with the problems of inadequate skilled manpower, unemployment, and underemployment. Unemployment and underemployment rates in the country increased from 5.1 and 16.3 percent in 2010 to 23 and 20.1 percent in 2018.About 11.49 and 16.08 percent of the labor force had post-secondary education in 2010 and 2018 respectively (NBS, 2018). Figures 1.1 and 1.6 show the part-time employment and unemployment trend in Nigeria. These programs were not implemented to the latter because of changes in political administration

in the country as such their stated objectives especially of making Nigeria one of the top 20 industrial economies in 2020 was not achieved.

The Economic Recovery and Growth Plan's (EGRP, 2017-2020) modified the major objectives of the vision 20:2020 as strategic objectives which were investing in people by increasing social inclusion, creating jobs, and improving the human capital base of the economy. This was to be achieved through investment in health and education by improving the quality of secondary and tertiary education, guarantee access to basic education to fill the skills gap in the economy. According to the NBS (2018), unemployment rate by educational qualification in 2015, 2016, 2017 and 2018 was 7.3, 10.1, 16.3 and 19.5 percent for those with primary education. It was 11.3, 12.2, 22 and 23.1 percent respectively for those with secondary school education while for those with post-secondary education, it was 12.4, 23.7, 25.7 and 29.8 percent respectively. Underemployment had been above 10 percent for all the educational levels throughout the period.

Between 2009 and 2020 the government had implemented vision 2010, NEEDS, Vision 20:2020, and the EGRP (2017-2020). Despite these plans by the government, the attempt to reduce the level of part-time employment had not been 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 had been above 14 percent between 2010 and 2018 as shown in figure 1.1.
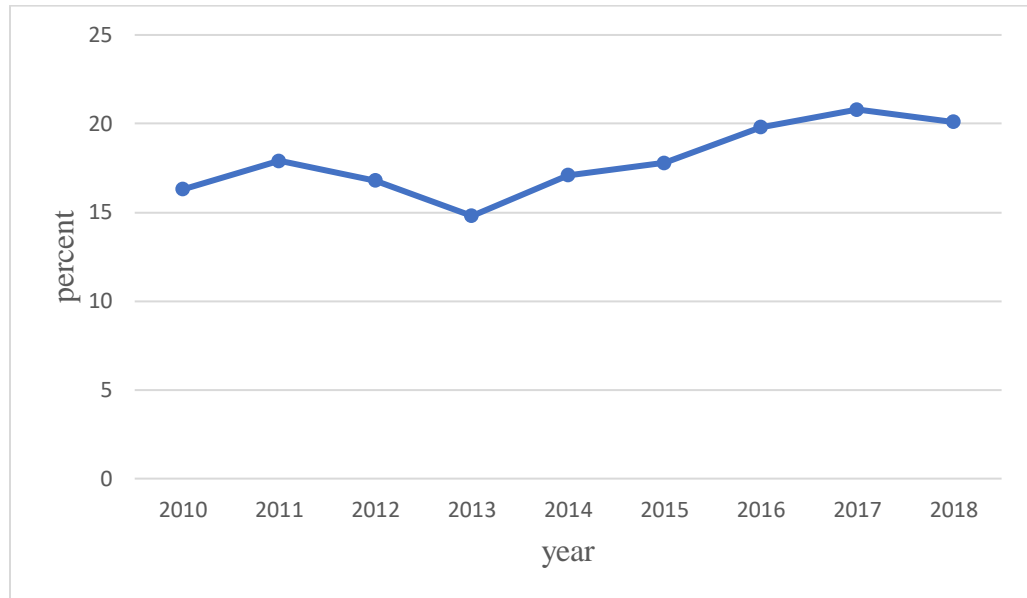
Figure 1. 1: Trend of Part-time employment in Nigeria.

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. The increase in Part-time employment as shown in figure 1.1 could be as 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, -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 led 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 labor and other related resources.

ILO (2016) asserts that nonstandard employment adversely affects productivity growth and economic performance.

The government in 1971 established the National Industrial Training Fund (ITF) to focus on training and acquisition of skills by labor in all areas for a self-sufficient nation. The fund does this through programs such as construction skills empowerment, women skills development, training, and empowerment of physically challenged persons, and the national industrial skills development program. Despite its activities, the fund opined that the skill level of Nigerians is still low (ITF, 2012).

In 1986 the National Directorate of Employment (NDE) was established to design and implement programs that would combat mass unemployment. The directorate's programs are skills acquisition through its centers, enterprise creation, training in entrepreneurship, transient and direct labor-based jobs such as the graduate attachment program and community development program. Between 2010 and 2017, a total of 896,522 unemployed persons benefitted from the directorate's programs while the total unemployed was 17.7 million in 2017.

1.1.2 Skills mismatch and Part-time employment

The development of skills for meaningful engagement in the production of goods and services is vital for productivity and growth, unemployment reduction, and improvement in the quality of life. When education, training, and skills acquired are relevant, there will be better adjustments, and utilization of technology in the production of goods and services. There will also be reduction in unemployment due to the high employability of skilled labor (Sparreboom & Tavid, 2016). When the skills acquired through the educational system fails to meet market demand, the economy will experience increasing unemployment and the cost of

hiring labor will be high due to the additional cost of upgrading worker skills (Bartlett, 2013). Low-quality education and systems, newly created forms of work organization, technological innovations, new sources of job creation, demographic changes which can adversely affect labor market outcomes are drivers of skills mismatch (ILO, 2016, 2017).

Skills mismatch occurs when the skills acquired and supplied by labor is not commensurate with what is required by employers of labor. It can be above or below what is required or is not needed by employers. It is measured as undereducation or qualification/overeducation or qualification or as an index of dissimilarity, which is employed by this study. The index used in this study according to ILO (2013) is a macro-economic index that is computed based on the education levels of the unemployed and those employed with the same level of education. It takes values between 0 and 1 or 100 percent, where 0 means that skills demanded and supplied match while 1 or 100 percent meant that skills required and demanded do not match. It is meant to reflect the suboptimal match between workers and jobs in terms of skills and qualifications (Vandeplas & Theiem-Thysen, 2019).

The national policy on education identified education as the most vital instrument for national development. The learner was expected to acquire appropriate skills and develop the mental, physical, social abilities and competencies as tools for livelihood. It is primarily aimed at the development of skilled manpower at all levels (primary, secondary, and tertiary) that will contribute to national development (Federal Republic of Nigeria, 2004, 2014). Despite the various plans and programs that were aimed at improving skills and

education in Nigeria, the nation had not experienced remarkable improvement in educational and skill development as shown in figure 1.2
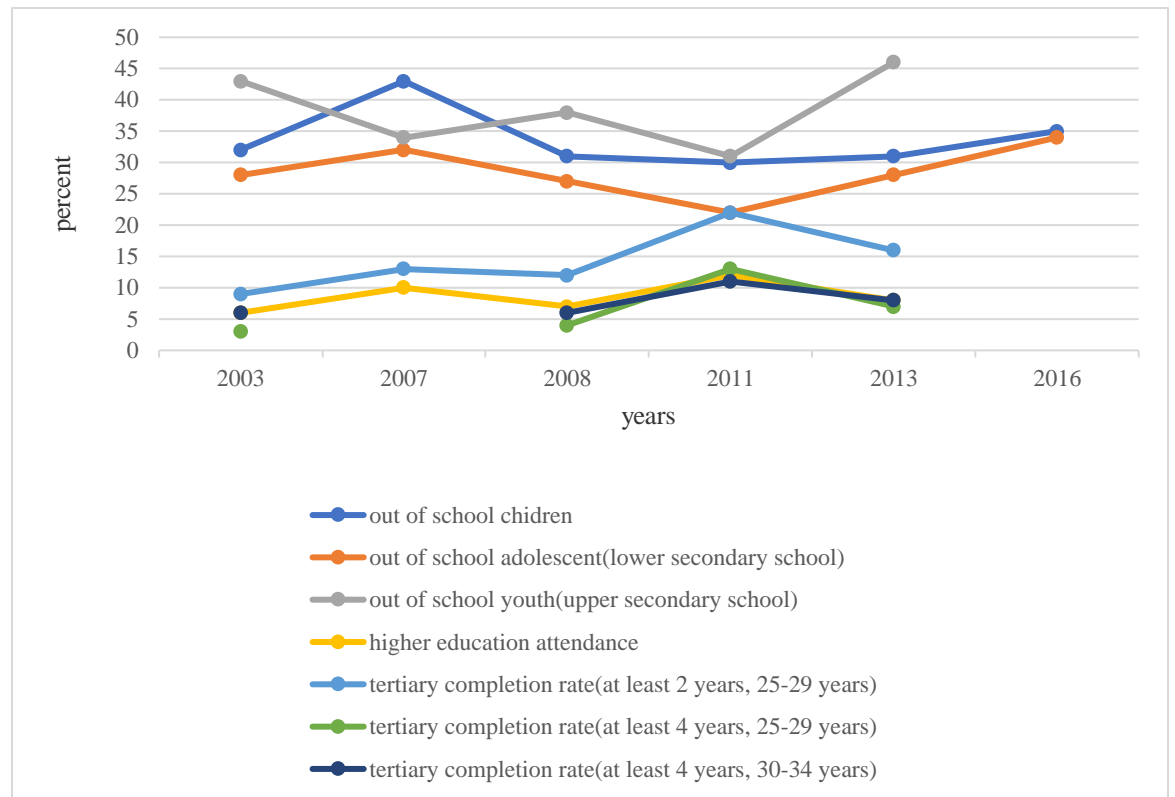
Figure 1. 2: Some indicators of formal education in Nigeria.

Source of data: United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020).

From figure 1.2, from 2003 to 2016, between 30 and 43 percent of school age children were out of school. For adolescents, it was between 22 and 24 percent, while for the youth it was between 31 and 51 percent that were out of school. The tertiary school attendance rate was between 6.0 and 12 percent and completion rates were between 9.0 and 22 percent for those between 25 and 29 years that studied for at least two years. The rate dropped for the same age group to between 3.0 and 13 percent for at least four years of study. For those between

30 to 34 years who studied for at least four years, the completion rate was between 6.0 and 11 percent. According to UNESCO (2020), the mean number of years of schooling for those between ages 20 and 24 in Nigeria was between 0.07 years and 0.11 years (less than a year and a half). This implied that the youths were not acquiring the needed educational skills. It also means that most of those who attend tertiary institutions drop out without graduating with the needed skills for employment and meaningful contribution to economic development. This harms the qualitative supply of skilled labor, labor productivity and output.

According to FMLE (2017), employers of labor in Nigeria have complained about the time it takes to train and bring employees up to the required industry standards. The FMLE further asserts that the jobless growth of the economy between 2011 and 2015 revealed the industrial adjustment difficulties and mismatch between the supply of labor skills by educational institutions, and industry skill requirement for employment, that will enhance growth.

Poor worker skills, therefore, contributes to inadequate resource utilization and the inability of workers to move from low to high productivity jobs. It also contributes to loss of production due to unfilled job vacancies, loss of earnings by labor for the period of unemployment, increased government expenditure due to payments of unemployment allowances (Bartlett, 2013; Quintini, 2011; Skott & Auerbach, 2003; Olitsky, 2008; Lucifera & Origo, 2002).

Various skills acquisition programs by the ITF and NDE had been established and funded by the government to improve labor skills by reducing skills mismatch, enhance labor productivity, and reduce unemployment in the economy. According to Palmer (2017), there has been a dearth of study in low

and middle-income countries on skills mismatch compared to the developed countries where significant attention has been given to the incidence, impacts, determinants, and policy responses on skills mismatch.

Studies by Estavao and Tsounta (2011), Dimian et al. (2017), found that skills mismatch and skill shortages contribute to the increase in unemployment while Aminu (2019), found that the probability of unemployment due to skills mismatch is dependent on the graduate's area of specialization.

The global economy has been changing and so is the structure and nature of employment. Employment change has been largely from the conventional full-time employment to part-time or other forms of nonstandard employment. According to the ILO (2016), this change was brought about through globalization that 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 labor 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 laborers, temporary help, part-time workers, independent contractors, employees with contract companies, agency employees, and other forms of self-employment.

The ILO (2015,2016) stated that part-time and other forms of nonstandard employment are 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).

According to the ILO (2015,2016), part-time and other forms of nonstandard employment 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 work part-time. In Indonesia, the number of part-time workers increased from 16.1percent 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.

The ILO (2015,2016) further stated that 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.

Part-time employment is common in Nigeria and according to Okafor (2012), it is due to the rate of youth unemployment, globalization, the shift in production from manufacturing to services, the spread of information technology, and the 2005 law which legalized casualization, contract labor, and other anti-labor actions in Nigeria. The law allows for part-time employment in construction and maintenance of buildings for communal purpose such as markets, in rural areas

and towns. As a result of this law some workers had been illegally employed as part-time workers in urban areas and for more than 10 years in some cases. Figure 1.3 shows the nature of part-time employment (in percent) based on educational qualification in Nigeria from quarter one 2017 to quarter three 2018.
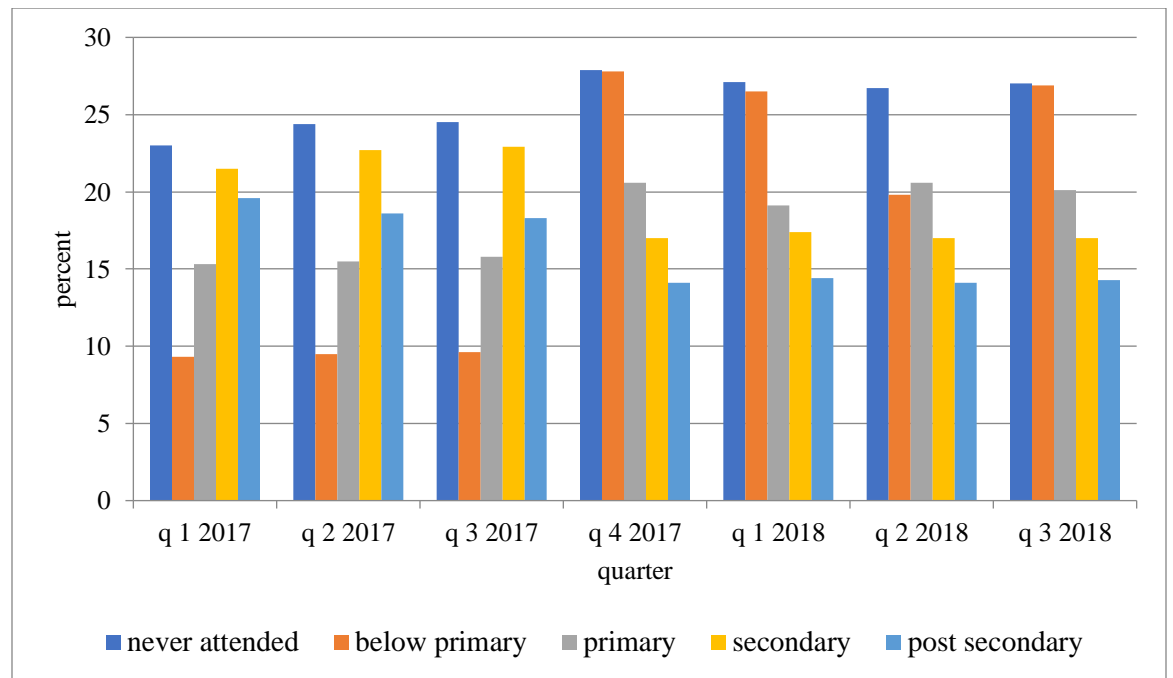
Figure 1. 3: Part-time Employment in Nigeria by Educational Qualification**.**
Source of Data: NBS, Labor Force Statistics 2017, 2018.

From figure 1.3, those who have never attended school were the highest proportion of those that were employed as part-time workers. The percentage of those hired increased from 23 percent in quarter one 2017 to 27.9 percent in quarter four of 2017 and remained at an average of 27 percent in the three quarters of 2018. The least hired part-time workers were post-secondary certificate holders at less than 20 percent throughout the period. Between 2010 and 2018, about 20 percent (one out of five) workers were part-time employees that have been contributing to the production of goods and services in the economy.

The ILO (2016), stated that part-time and other forms of nonstandard employment had possible adverse consequences such as; risks to the sustainability of social security, increased labor market volatility, underinvestment in innovation, a slowing of productivity growth, and poor economic performance with other social consequences. With regards to 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 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 nonstandard employees and positive effects in plants with about 11.3 percent nonstandard workers in Germany.

1.1.3 Output gap, economic growth, and unemployment

The availability of skilled manpower determines the use of technology, raw materials, power or electricity in the production of goods and services. The Nigerian economy has not effectively utilized its resources which could be as a result of the low mean years of education, a high number of out-of-school youths, adolescents, and children, and the low tertiary education completion rate among others. This has contributed to an average annual manufacturing capacity utilization that was less than 60 percent between 1981 and 2010 and, an unemployment rate of about 23 percent in 2018 (CBN, 2018; NBS, 2018). Such high-under-capacity utilization and unemployment rates suggest that an economy could be producing below its potential (Giorno et al., 1995; Yang,

1979; Kara et al., 2007). Moreover, youth unemployment rate of about 29.7 percent in 2018, land border closure, the exorbitant cost of licenses, high level of perceived corruption, epileptic power supply in Nigeria, contribute to making the economy underutilize its available resources and makes actual output vary from the potential (Yang, 1979). All of these factors contribute to macroeconomic management problems. According to Kara et al. (2007), a negative output gap indicates deficient demand which will require stimulation using various policy measures. While a positive output gap is perceived as a problem of excess demand and will require policy tightening to avoid high inflation in the economy. The Nigerian economy, based on the consumer price index (CPI) seems to have had inflationary problem between 2010 and 2018 as shown in figure 1.4.
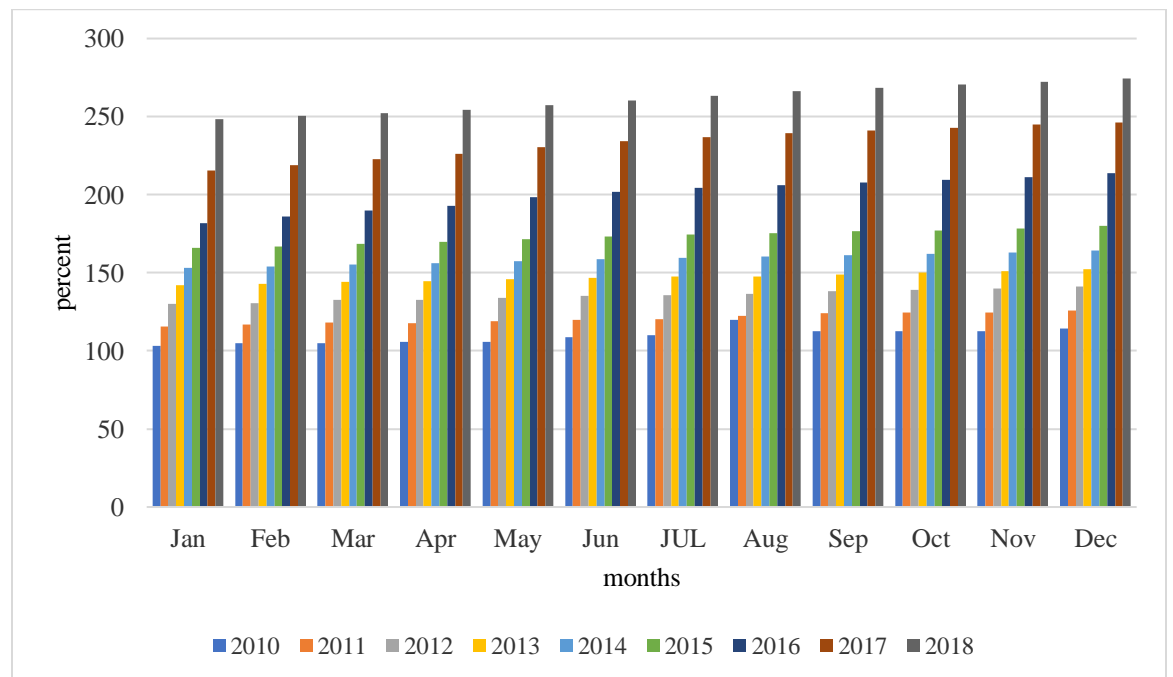
Figure 1. 4: Consumer Price Index for the period 2010 to 2018.

Source of Data: Central Bank of Nigeria, Statistical Bulletin 2018.

From figure 1.4, there has been an increase in the CPI for Nigeria from 103.1 percent in January 2010 to 248.4 percent in January of 2018. The increase in the

CPI from 2009 to 2018 was by 174.6 percent. Also, between 2010 and 2018, the year-on-year headline inflation was between 7.7 and 18.7 percent. Core inflation was between 6.2 and 18.2 percent while food inflation was between 8.7 and 20.3 percent (Central Bank of Nigeria [CBN], 2018). The increase in the CPI could be as a result of the continuous deregulation of petroleum price from 60 to 160 naira per-liter, the devaluation of the value of the naira, Boko Haram insurgency. The CPI increase shows a fall in the standard of living of Nigerians and possible inflationary problem in the economy.

The sectoral nominal growth rate in agriculture, industry, and services sectors as broadly classified by the EGRP has been mixed. The agricultural sector grew by 6.7, 2.94, and 4.27 percent in 2012, 2013, and 2014 respectively. In 2015 it grew by 3.72 percent and in 2016, 2017, and 2018 the growth rate was 4.11, 3.45, and 2.12 percent. The growth rate for industry in 2012, 2013, 2014, and 2015 was 2.43, 2.16, 6.76, and -2.24 percent. The sector grew by -8.85, 2.15, and 1.87 in 2016, 2017, and 2018 respectively. The services sector growth rate was 3.97, 8.38, and 6.85 in 2012, 2013, and 2014. The sector further grew by 4.78 and -0.82 in 2015 and 2016 while in 2017 and 2018, it was -0.91 and 1.83 percent (NBS, 2019).

Disaggregated real growth at 2010 constant prices in the agricultural, manufacturing, mining and quarrying, building and construction, transportation, food and accommodation, trade and related and, the financial sectors identified in Vision 20:2020 and the EGRP for the period 2011 to 2018 also reveals the mixed level of growth in the economy as shown in figure 1.5.
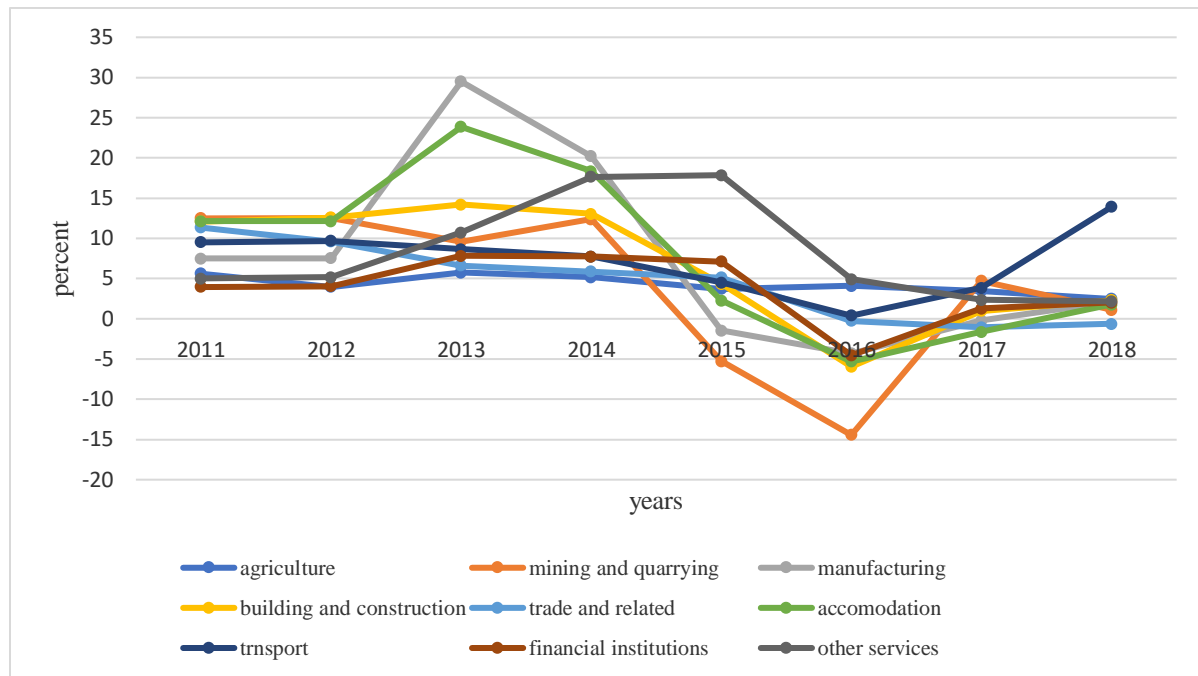
Figure 1. 5: Sectoral growth rate between 2011 and 2018 at 2010 constant prices.

Source of Data: NBS (2013, 2019).

From figure 1.5 the sectoral growth for all the sectors was stable between 2011 and 2012 and increased in 2013 by 5.76 percent in the agricultural sector (the lowest) and 29.49 in the manufacturing sector (the highest). Growth in all the sectors decreased between 2014 to 2016. This was because international crude oil price declined in 2014 and led to a recession in 2016. In 2017, the manufacturing, trade, accommodation, and food sectors had negative growth rates of -0.21, -1.05, and -1.61 percent respectively.

The highest positive growth rate was 4.72 percent in mining and quarrying while the lowest was 1 percent in building and construction. The sectoral growth rate in 2018 was between -0.63 in trade and 13.91 percent in transport. As a result of this, the economy's real annual average output growth rate was 3.15 percent between 2011 and 2018 instead of 6.22 percent that was the targeted average growth rate. This could contribute in making the economy produce below its

potential. There had been various findings with regards to the output gap in different countries. Pitambar (2010), found that the Nepalese economy was producing above its potential while Nepal Rastra Bank (2017), found that the output gap followed the monsoon years. Ghalayini (2019), found that the economy in Lebanon was also performing above its potential while labor was found to contribute to potential output growth in Saudi Arabia (Alkhareif et al., 2017).

Output per worker in Nigeria according to the WB (2019) in USD 2011 PPP increased by 7.76 percent between 2012 and 2015 but decrease by 5.78 percent between 2015 and 2018. In constant 2017 (PPP) USD it was 40.68 and 47.3 percent of the value of output per worker in South Africa and Egypt. It was 33.76 percent per worker output value in Malaysia, 23.96, and 11.91 percent per worker output value in the Korea Republic and Singapore respectively (World Bank, 2020). The output per worker is therefore low in Nigeria when compared to these countries. According to FMLE (2017:9), "Nigeria's output per worker is 57 percent less than the average of the seven large developing economies of the world."

The national policy on employment provides that the government, alongside the private sector will develop programs to link education and training to employment (FMLE, 2017). This is guided by the philosophy that decent work serves as an incentive for individuals to apply human resources to the fullest in alleviating poverty. The policy aimed at attaining a high level of employment in the economy, providing a functional educational and skill training system, improve teacher quality, and provide appropriate incentives for teachers. The demand of the labor market according to the policy shall be aligned with the

educational and skills training systems. Skills, knowledge acquisition that are relevant for employment are strategies that will be implemented. Over the years various skills acquisition plans and programs were established by the National Directorate of Employment (NDE) and the National Industrial Training Fund (ITF). Despite their activities, there had been steady increase in the rate of unemployment in the country as shown in figure 1.6.
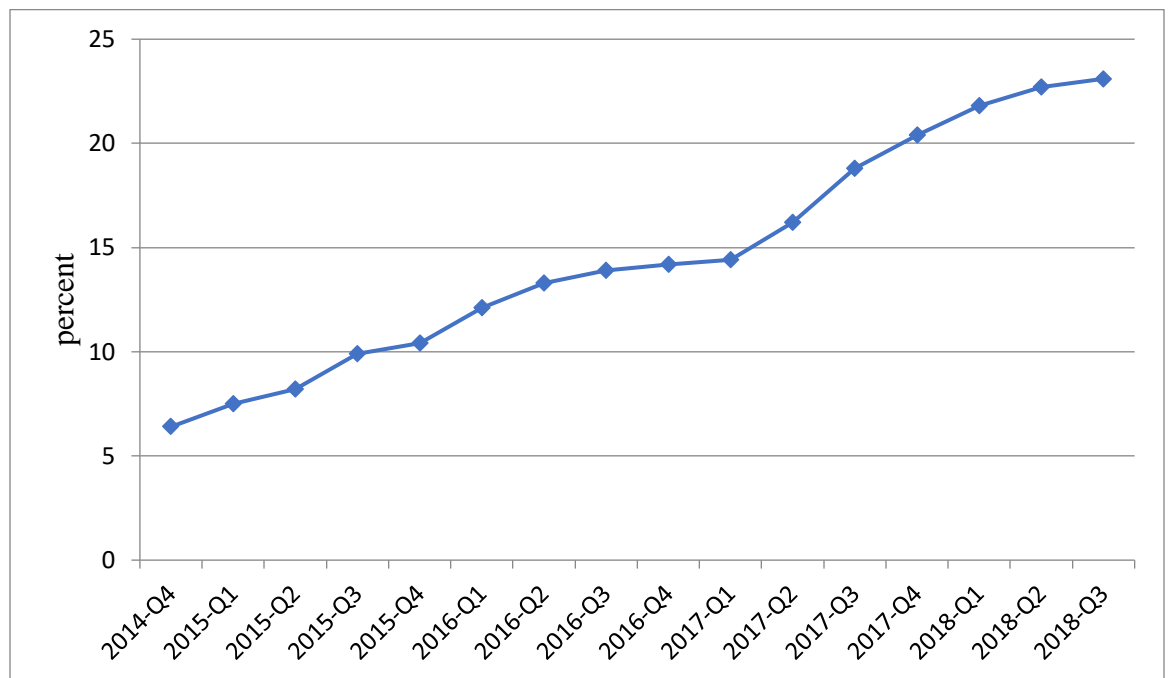
Figure 1. 6: Trend of unemployment in Nigeria.

Source of Data: National Bureau of Statistics 2018.

From figure 1.6 unemployment rate in Nigeria increased from 6.4 percent in quarter four, 2014 to 14.4 percent in quarter four 2016. In the third and fourth quarters of 2017, it increased from 18.8 to 20.4 percent. The unemployment rate increased from 21.8 to 22.7 and 23.1 percent in the first, second, and third quarters of 2018 respectively. The nation could not achieve the targeted goal of reducing unemployment by 5.09 percent between 2017 and 2020 but rather, it increased by 10.78 percent (NBS,2018,2020; MBNP,2017). This could be as a result of the jobless growth in the economy between 2011 and 2015, the

recession of 2016 and the population growth rate of about 3 percent per-annum. According to ILO (2013), different levels of unemployment by educational standing shows the existence of skills mismatch in an economy. The unemployment rate by educational qualification in Nigeria was above 10 percent between quarter one 2017 to quarter three 2018 among post-secondary school graduates which peaked at 32.4 percent in the second quarter of 2018. This was followed by the below primary at 31.7 percent in the same quarter. The rate amongst those that never attended school had increased from 14.8 percent in quarter one 2017 to 21.8 percent in quarter three 2018 (NBS,2018). The level of skills mismatch in the economy is shown in figure 1.7
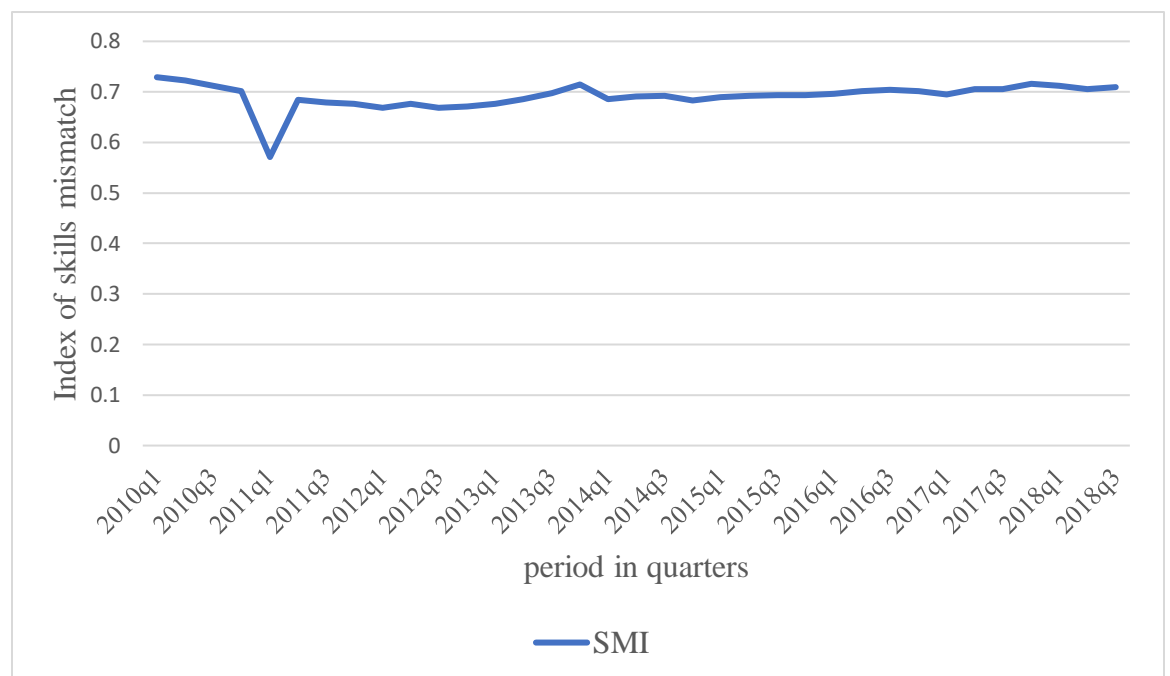
Figure 1. 7: Trend of skills mismatch in Nigeria.

Source: Author's computation from NBS Labor Surveys Various issues.

From figure 1.7 the level of skills mismatch was between 0.571 and 0.714. This implies that labor skills acquisition for employment is quite poor. This is possibly why the nation experienced jobless growth between 2011 and 2015. The level of mismatch is likely the reason why employers of labor in Nigeria

have complained about the high cost of upgrading worker skills to industry requirement (FMLE,2017). This situation had contributed to the low level of capacity utilization and output growth in the country with the potential of increasing crime and criminality both within and outside the nation.

Skills mismatch was found to have varied effects on unemployment. Sparreboom and Tavid (2016), found that during the period of the global financial crisis, as skills mismatch dampened, the unemployment rate also dampened. Estavao and Tsounta (2011), Dimian et al. (2017), Humal (2013), found an increase in unemployment due to skills mismatch. Aminu (2019), found less probability of unemployment among certain categories of graduates (medical sciences, engineering, social sciences, and business) in Nigeria while higher unemployment probability among graduates of arts, science, law, and education specialization.

1.2 Statement of the Problem

The Federal Government had over the years focused on reducing time-related underemployment but instead it had increased by 69.10 percent between 2010 and 2018. An average of about 20 percent are part-time workers whose abilities are underutilized. This alongside the low level of school attendance had contributed to the 3.15 percent average growth rate instead of the targeted 6.22 percent between 2011 and 2018. Sectoral growth increased between 2011 and 2013 but decreased from 2014. This was because labor productivity decreased by 5.78 percent between 2015 and 2018 and was 57 percent less than the seven fastest developing nations. Unemployment was targeted to fall by 5.09 percent between 2017 and 2020 but increased by 10.78 percent and the nation's CPI had increased by 174.6 percent between 2009 base year to 2018 suggesting an

inflation problem in the economy with adverse effects on the lives of Nigerians (UNESCO, 2020; MBNP, 2017; CBN, 2018; NBS, 2018; FMLE, 2017; MTEF, 2013, 2018; WB, 2019). The ILO (2016) stated that increased labor market volatility, underinvestment in innovation, slowing of productivity growth and poor economic performance alongside other consequences are some of the possible effects of part-time and other forms of nonstandard employment in an economy. The low-level of labor productivity, high unemployment, and time-related underemployment rates have persisted despite the implementation of various economic plans and programs. This situation had contributed to insecurity in the country and may continue if it is not addressed.

Kunn-Nelen et al. (2013), Specchia and Vandenberghe (2013), Garnero, Kampelmann, and Rycx (2014), Nielen and Schiersch (2016), Divicienti, Grinza and Vannoni (2018) studied part-time employment effects on productivity in advanced western European economies in a sector, firms or plants. This study will be on a developing African economy based on several sectors rather than a sector, firms, or plants. Pitan and Adedeji (2012) and Aminu (2019), studied the unemployment effects of skills mismatch on graduates of tertiary institutions. This study used a skills mismatch index that included the primary, secondary and tertiary levels of education. Adamu et al. (2009), studied the output gap using VAR for the period 1980 to 2008 and did not consider skills mismatch. This study used the production function method and included skills mismatch that was not used in previous studies.

1.3 Research Questions

(i)What is the effect of part-time employment on labor productivity?

(ii)What is the effect of skills mismatch on unemployment?

(iii)What is the effect of skills mismatch on the output gap?

1.4 Study Objectives

The broad objective of this study is to find out the effect of part-time employment and skills mismatch on output per worker, unemployment, and the output gap in Nigeria. The specific objectives are to;

(i)Examine the effect of part-time employment on labor productivity.

(ii) Determine the effect of skills mismatch on unemployment.

(iii)Investigate the effect of skills mismatch on the output gap.

1.5 Significance of the Study

This study will be of use to the government of Nigeria because it will enable the nation to assess its quality of manpower development and enable it to diversify the economy from an oil driven economy to a knowledge driven economy. It will also help educational planners to evaluate the relevance of the curriculum used for manpower development. The private sector will also be able to know the extent to which part-time employment contributes to labor productivity and determine the benefits of it. The country will also be able to come up with a comprehensive policy on part-time employment.

1.6 Scope of the Study

The study focused on skills mismatch, part-time employment, and how they affect economic growth in Nigeria based on the International Standard Industrial Classification (ISIC Revision 4.0). The sectors based on the Vision 20:2020 and the Economic Recovery and Growth Plan (2017-2020) are the agricultural,

mining and quarrying, manufacturing, building and construction, finance and insurance, food hotel and accommodation, transportation and storage, and trade. The study will use quarterly data for the period 2010 to 2018 because the economy was rebased in 2010. This had adverse consequences on the economy because of its import-dependent nature.

1.7 Organization of Study

The study was organized as follows: Chapter One presents the background to the study, research questions, study objectives, scope of the study. Chapter Two reviewed relevant literature both theoretical and empirical while Chapter Three presents the research design, empirical models to be estimated, data collection, and estimation procedures. In chapter four, empirical findings of the study was presented while chapter five presents conclusions and recommendations for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical literature

Various theories have been developed that shows the relationship between labor market conditions and output or output growth in an economy. The theories reviewed are Okun's law, Solow-Swan.

2.1.1 Solow-Swan model

According to Barro and Sala-i-Martin (2004), 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 a 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: labor, capital and knowledge or effectiveness of labor.

Labor and capital are assumed to be rival goods while knowledge is nonrival. Changes in population, labor skills, labor participation rates and number of hours worked by labor leads to changes in labor and output overtime (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 labor productivity. Output is produced with a combination of labor, capital and technology or knowledge using different amounts available at any time. The production function takes the form

$$Y(t) = F(K(t), A(t), L(t)) \qquad (2.1)$$

Where Y is output, K is capital, and A is knowledge or effective labor, L is labor and t is time. Some basic assumptions or characteristics of the production process are; First, time does not come directly into the output process, but only through K, L, and A. That is, the output will only change over time if the production inputs change. In particular, the amount of output produced from the given quantity of capital and labor increases over time. Only an increase in knowledge leads to technological progress. Second, there is diminishing return to private inputs. Thirdly, as labor (capital) inputs approach infinity, the marginal product of labour (capital) approach zero and as labor(capital) approach zero, the marginal product of labour (capital) approaches infinity. A strict amount of positive factor input(s) is needed to produce a given level of output (Barro & Sala-i-Martin, 2004).

A fundamental assumption of the theory is that the production function has constant returns to scale in two arguments- capital and effective labor. That is, the amount produced will double if capital and effective labor (K and L) are doubled. Multiplying labor and capital by a given factor will increase output by that same factor holding technological progress(A) constant.

$$F(cY) = F(cK, A, cL) = cF(K, A, L) \text{ for all c} \geq 0 \qquad (2.2)$$

This assumption allows for using the production function in an intensive form. Setting $c = 1/L$ equation 2.2 becomes;

$$F\left(\frac{Y}{L}\right) = F(\frac{K}{L}, A, 1) \qquad (2.3)$$

The amount of capital per labor is K/L and output per labor is $F\left(\frac{Y}{L}\right)$. Define $k = K/L$, $y = Y/L$ and $f(k) = F(K, 1)$ equation 2.3 can be written as;

$$y = f(k) \qquad (2.4)$$

that is, output per effective worker is a function of capital per effective worker.

In the long-run, economic conditions do not determine growth and economic policy has no effect on growth because per capita GDP cannot grow unless there is growth in A (Aghion & Howitt, 2009). Technological change is what will affect growth but the theory treats technological change as exogeneous. There will be a permanent increase in per-capita GDP when labor productivity is enhanced by technological progress. Therefore, only growth in the effectiveness of labor can lead to permanent growth in output per worker because of the modest effect of changes in capital per worker on output per worker. The model does not provide an exact meaning for effectiveness of labor, whose behavior is exogenous. Economic growth is treated in the theory as independent of any form of international activity between nations and empirically, savings is not necessarily the only driver of growth in an economy.

According to Aghion and Howitt (2009) the theory has been extended over the years to include endogenous consumer optimization by Cass (1965) and Koopmans (1965), money, inflation and public expenditure by Sirdrauski (1967), Blanchard (1985) and Barro (1990). Human capital was introduced as a third factor in the model by Makiw et al. (1992). This theory is relevant to this study because it will enable the computation of sectoral labor productivity and can be augmented will labor skills.

2.1.2 Okun's law

This law was developed by Arthur Okun in 1962 (Ball et al., 2013) and it shows an empirical relationship between output and unemployment. The law which was primarily based on USA data shows that, there will be a decrease in unemployment by one percentage point when output increase by three percentage point. This implies that, when there is an increase in output there will be an increase in the employment rate or a decrease in the unemployment rate. The law relates the labor market with the production of goods and services in the economy. The state of the labor market in terms of number of workers, labor force participation rate, skills acquired by labor are assumed to positively add to the level output that leads to growth and fall in unemployment.

The law can be expressed in levels, using the gap approach or in growth form when attempting to estimate its applicability in an economy. The law in its initial form did not provide for the influence of other variables that affect unemployment. Therefore, there is the problem of omitted variables which led to the development of the dynamic version of the law (Stock & Vogler-Ludwig, 2010).

Okun's law has some relevance to the Nigerian situation because quality of labor is critical in the production process. The agricultural sector in Nigeria is major the employer of labor and contributor to the GDP and is a labor-intensive sector. The quality of labor will therefore affect economic growth and unemployment in the economy. The law explains how output changes affect unemployment and the dynamic version enables the use of other variables that such as skills mismatch that affect unemployment.

2.2 Review of empirical literature

Various studies have been done in different countries with regards to labor market related problems and output. Some of these studies have been reviewed here.

2.2.1 Part-time employment and labor productivity

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 an administrative data and focused on the core employees of the sector. 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. Firm level characteristics such as average age of the pharmacy assistant, average tenure of pharmacy assistant, tenure of pharmacist, independent pharmacist, hours opened per week, excess labor, percentage of elderly within postal code, number of competitors within a radius of five kilometers, absentee ratio, firm size and newly found firms were control variables.

The study found that there is greater output per-worker in firms with larger share of part-time workers compared to firms with a larger share of full-time workers. Where there is an increase of 10 percent in the share of part-time workers, output per-worker increased by about 4.8 percent. The study was on a sector and narrowed its focus to a set of workers whose characteristics are homogeneous. The cross-sectional nature of the study did not allow for possible control of unobserved heterogeneity. This study will use panel data and will focus on the

effect of part-time workers on sectoral output per worker in Nigeria as against firms in a sector.

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, 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 in 10 percent of part-time employees. The inverse relation 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 in order to cope with demand. The study was done at the firm level but this study will be done at a more aggregated sectoral level on per worker output.

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 differenced GMM. Log of value added per hour, full time, part time, percentage of women, age, firm size, educational level, sector, managers and professionals, skill classification were some of the variables used in the study. The study findings reveal that part-timers generate rents for employers with regards 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. The study excluded firms in the financial, gas and water supply industries. This study will also be on part-time workers in Nigeria and at an aggregated (formal) sectoral level in the economy rather than individual firms.

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, percentages 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. Plants with 11.3 percent share of temporary workers have a maximum effect of about 14.2 percent on productivity while those with 20 percent or more experience significantly less productivity. The study focused on plants in manufacturing, trade and repair, communication and transport, industrial services excluding real-estate, and hotel and restaurants. This study will focus on part-time workers as against temporary workers at a more aggregate sectoral level of the formal sector in Nigeria.

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 share. This was as a result of horizontal rather than vertical part-time arrangements. The study excluded firms in the financial sector and agricultural sectors and, used an organizational measure of productivity rather than per- hour or -worker measure of productivity. This study will use the per worker productivity at the formal sectoral level rather than the firm.

2.2.2 Skills mismatch and unemployment

Estavao and Tsounta (2011), used 2006 Current Population Survey, US bureau of Labor Statistics Panel data set at state level for the period 2008 to 2010 to analyze the impact of skills mismatch and housing crisis in the USA on unemployment. Unemployment rate, housing prices, real GDP, state level GDP growth rate, skills mismatch index, population by educational standing, state and time control dummies as variables in the study. A difference specification of the Okun's law was used as a model and was estimated with OLS and 2SLS. It was found that skills mismatch does lead to an increase in the unemployment rate. A

third of the overall increase in structural unemployment is associated with about 17 percent increase in skill mismatches. Also, skills mismatches and higher foreclosure rates have likely been responsible for a rise of about 1.5 percent in the unemployment rate. The study did not address the persistence in the structural unemployment rate in the USA due to data limitations on skills mismatch and focused on state level. This study will use data on quarterly basis at the national level and use a different measure of skills mismatch.

Pitan and Adedeji (2012), used the six geo-political zones of the country of Nigeria in their study. Six hundred management staff (in the public and private sectors), evaluated the skills of 300 hundred employed. The study employed a descriptive approach, analysis of variance (ANOVA) and t-statistics for its analysis. It was discovered that there was an inverse relationship between skills demand and supply. Significant mismatch was found in the area of communication, information technology, decision making, critical thinking and entrepreneurial skills. The study therefore concluded that university graduates in Nigeria were not adequately prepared for work given the set of skills demanded for in the labor market. The study focused on skills gap from the management and employer point of view. The study is also narrow in its perspective given that it only focused on one set of post-secondary educated Nigerians. This study will use a mismatch index that utilizes information of primary, secondary and tertiary education certificate holders in the country.

Humal (2013), did a study on 21 counties in Sweden. Panel data from Statistics Sweden and the National Labor Market Board for the period 2001 to 2011 was used. The study used fixed effect model and regressed unemployment on SMI using OLS. GDP per capita, educational attainment, sex and age composition,

educational groups of the unemployed were variables used in the study. The study found that there was a decline in skills mismatch in Sweden from 2001 to 2011 and a significant positive association between unemployment and skills mismatch. An increase in skills mismatch by one percent leads to between 0.17 and 0.26 percent increase in unemployment with an elasticity of unemployment to SMI of 0.21 percent. The study used the lower bounds of education-occupation mismatch for which the real mismatch may be greater than what the SMI may indicate. Also, a formal criterion for the education-occupation determination is vague. This will use a different measure of mismatch and model and will be at the national rather than county or state level.

Sparreboom & Tarvid (2016) studied European countries with data from the European Social Survey for 2002, 2004, 2006, and 2008,2010 and 2012 on unbalanced Job Polarization and skills mismatch in Europe. Panel data model at the macro level and multi-level mixed effects logistic models at the micro level were used for the study. The study measured skills mismatch as over- and under-education at micro level and constructed and index at the macro level. The ordinary least square was used for estimation at the macro level of the study. Change in medium level jobs, imbalanced high- and low-level jobs, job polarization index, skills mismatch index, GDP growth, log GDP per capita and population growth were used as variables in the study. It was found that in most of the 31 European countries studied, the index of skills mismatch increased in 2012 compared 2000 but dropped in 11 of the 31 European countries.

Skills mismatch index peaked in 2008 when the financial crisis started after sliding down between 2000 and 2003. The crisis was found to have dampened mismatch because of the reduction in the unemployment rate of those with

primary education compared to those with secondary and tertiary education. At the micro level, the study found that, in majority of the countries, over education increased in at least one measure and under education decreased in at least one measure but growing in five countries. Women were found to be more frequently over educated and less frequently under educated than men of their age group and gender differences decrease overtime. The main result of the macroeconomic regression analysis is that imbalanced work heterogeneity adversely affects the discrepancy between the demand for skills and the skills supplied by the level of education, but there is no major reverse impact. Also, imbalanced job polarization affects the mismatch between skill supply and demand adversely. The study did not consider the effect of skills mismatch as it affects unemployment directly. This was done jointly with job polarization. This study will focus on the direct effect of skills mismatch on unemployment.

Dimian et al. (2017), did a study on skills mismatch, unemployment and economic growth in 28 European countries, using EUROSTAT and ILOSTAT data for the period 1997 to 2015. The study used panel data model with a dynamic Okun's law as a theoretical basis to investigate the main drivers of unemployment in Europe, the long- and short-term impact of GDP growth, skills mismatch on unemployment. The study used the two stage least square (2SLS) and auto regressive distributed lag (ARDL) and found that, both in the long and short run, the rate of unemployment among the young and low educated is more responsive to economic growth while the rate among older workers shows greater capacity for adjustment.

The study also found that occupational mismatch has mixed effect across countries in the short run but has significant long-term impact on unemployment

changes of all categories of the unemployed. The use of occupational mismatch as a measure of skill mismatch in the study varies with the perception of the worker. This study will construct a skill mismatch index to analyze its effect on unemployment.

Aminu (2019), did a study on skills mismatch and graduate (post-secondary, bachelor's degree holders) unemployment in Nigeria with data from the National Bureau of Statistics of Nigeria for the period 2012 to 2016. The study focused primarily on education-job mismatch based on academic disciplines of graduates. These disciplines were classified into medical sciences, social and business studies, engineering, education, sciences and computer science and mathematics, law, arts. Using the variance of relative unemployment and proportional index of the unemployed to compute and explain mismatch, the study found that, based on the proportional index, graduates of medical sciences, engineering, social sciences and business studies are less likely to experience unemployment compared to graduates in the arts, law, sciences and education specializations.

Mismatch was found to be low but increasing and unemployment rate increased from 2014 across education levels at different rates. The study did not analyze how skills mismatch affect unemployment at all educational levels. It focused mainly on post-secondary certificate holders. This study will be on all educational levels and will not use the variance of relative unemployment and proportionality index but a skills mismatch index developed by the ILO.

2.2.3 Output Gap

Adamu et al. (2009), studied the output gap for Nigeria between 1980 and 2008. The study used annual and quarterly data obtained from the Central bank of Nigeria and the World Development Indicators. Structural VAR approach, linear trend and the HP filter approaches were used to estimate the output gap. Capacity utilization, real gross domestic product and employment which was proxied by labor force were the variables used in the study. The study found that, the quarterly data performed better in analyzing the Nigerian economy. It pointed out the mild and deep recession of the 1980s and 90s and the boom of the year 2000 to 2008. The VAR method was found to be a poor estimator of the Nigerian economic situation with regards to the potential output and the output gap and concluded that it might be as a result of the annual data used since the quarterly data performed better. The study focused on the relevance and applicability of some of the different methods of estimating the output gap. Though employment, proxied by labor force was used as an explanatory variable, its effect was not analyzed. This study intends to use quarterly data for the period beginning from 2010 to 2018. The production function method which is rooted in economic theory will be used to estimate the potential output, output gap and the effect of the part-time employment on the output gap.

Pitambar (2010), did a study on potential output and the output gap in Nepal. The study used the production function and the HP filter methods to estimate the potential output of Nepal and the output gap. Time series data was used for the period 1975/76 to 2008/2009. Data from various issues of Economic Survey, Ministry of Finance, Government of Nepal (GON), Population Census, Central Bureau of Statistics (CBS) and Nepal Labour Force Survey. The study variables

were, real GDP (RGDP), real capital stock (RKS), economically active population (EAP), potential GDP estimates from HP filter (RGDPHP), potential GDP estimates from production function approach (PRGDP), output gap estimate from production function approach (YGAP), output gap estimate from HP filter (YGAPHP). The study found that there was no remarkable difference between the production function and HP filter methods in estimating potential and output gap in Nepal because the correlation coefficient was 0.93.

Based on the HP method, the Nepalese economy was found to be above its potential level before 1979 and between 2008-2009, thus reflecting a positive output gap and an economy that had inflationary problems within the period. While in the 1980s (1981-1990) and between 2002-2007, there was a fall in actual output by more than one percentage point below the potential output which suggest deficient demand and, an economy that was operating below its potential. The production function method estimates show that on the overall, the economy was operating close to its potential output with smaller fluctuations in the output gap in the 1990s, 2007 to 2009 compared to 1976 to 1980. There was also a large downward swing of the output gap in 1980, 1983 and 1987. Between 2002 and 2007, the study found that the economy was operating below its potential. This was reflected by the negative output gap but went through inflationary problem between 2008 and 2009. Both approaches show that potential output in Nepal has been falling continuously, especially after the mid-1990s.While the study had economically active population as one of the study variables, the effect of the variable on the output gap was not considered. This study will give attention to the effect of the quality of skills of the economically active population of Nigeria has on the output gap.

Bank Negara Malaysia (2012), did a study on potential output and the output gap in Malaysia between 1995 and 2011 with data from the Department of Statistics Malaysia. The study used the production function approach which was based on the Cobb-Douglas production function, with constant returns to scale. The variables used in the study were unemployment rate, potential unemployment, unemployment gap, capital, labor share in the GDP, total factor productivity, potential labor, level of technological progress and inflation. The study found a positive or near zero output gap during the study period. The large negative output gaps corresponded with the Asian financial crisis (AFC), the technological bust (TechBust) in the US and the global financial crisis. It also found that as the economy recovers, the negative output gap gets reversed within two years.

The longest gap lasted only eight quarters during the AFC while the duration of both the TechBust and global financial crisis lasted for just six quarters. The economy experienced high inflation alongside negative output gaps during the AFC and the global financial crisis and low inflation with negative output gap during the TechBust. There was also a negative relationship between unemployment and the output gap. The study focused on the relationship between inflation, unemployment gap and the output gap. The effect of labor, especially employment was not considered. This study intends to find out how skills mismatch in Nigeria affects the output gap.

Nepal Rastra Bank (2017), in a related study on Nepal, used annual time series data for the period 1975 to 2017. The data was sourced from Current Macroeconomic and Financial Situation 2017, Economic Survey 2010/2011 and 2016/2017 published by the Ministry of Finance and World Bank Development

Indicators 2016. Potential output and output gap were estimated using the Hodrick-Prescott (HP) filter, Christian-Fitzgeral (CF) filter, Beveridge-Nelson decomposition, Unobserved Component Model and Production Function Approach. Real GDP at 2010/11 prices, gross fixed capital formation (GFCF) at current prices, deflator, Gross fixed capital formation (GCFC) at constant prices, capital stock(k), active population, Potential GDP_HP, Potential GDP_KF and Potential GDP_PF were the variables used to estimate the output gap. The study found that the output gap seems to follow the monsoon four-year cyclical period. The positive and negative gaps were related to favorable and unfavorable monsoon seasons.

The output gap was found to range between -4.2 and 2.4 percent using the various methods. The highest negative gap, which was below the potential level of output was in 1980 which was due to the severe draught in the country and the eventual fall in agricultural output. While the highest was in 2001 due to favorable agricultural weather conditions and the commissioning of a hydropower dam project. Furthermore, it was also found that potential GDP grew at a low rate of 4.3 percent within the study period and output gap fluctuations smoothen out after the 1980s with exceptions in 2001,2015 and 2016. The study also found that supply side factors such as natural disasters, weather conditions rather than aggregate demand fluctuations affect the output gap. While the study looked at the output gap, it did not give attention to manpower effects by active population (15-64 years) on the output gap. This study intends to use quarterly data and will focus on the effect that the quality of skills has on the output gap of Nigeria.

Alkhareif et al. (2017), did a study on the output gap of Saudi Arabia with annual time series data for the period 1980 to 2015. Data was from the General Authority for Statistics. The Cobb-Douglas production function alongside statistical estimates of HP filter and Kalman filter were used to determine the output gap. Labor, capital and total factor productivity were used as study variables. The study found that between 1980 and 2010 the economy potential GDP was less than actual by 1.1 percent while it was greater in the 2011 to 2015 period by 0.2 percent. Overall productivity was found to be negative between 1980 and 2010 but became positive between 2011 to 2015. Over the entire study period, it was found that output gap was positive but became negative as fiscal expenditures in infrastructure have better aligned potential and actual GDP. Both potential and actual GDP accelerated between 2011 and 2015 which was as a result of the resilience of the financial sector and higher labor force participation the increased by more than 13 percent due in part to labor market reforms that contributed to productivity. The study highlighted increased labor force participation rates as a contributor to the growth in both potential and actual GDP growth which does affect the output gap without estimating the extent of the effect. This study will measure the effect of skills mismatch on the output gap.

Fedderke and Mengisteab (2017), studied the potential output and output gap of South Africa for the period 1960 to 2015 with data from the South African Reserve Bank. Various statistical time series estimation techniques such as the HP filter, Baxter-King, Butterworth and Christiano-Fitzgerald were used to determine the output gap of South Africa. The study found that between 2010 and 2015, potential growth rate was between the range of 1.9 and 2.3 percent and between 2005 to 2007 there was a positive output gap. The output gap was

negative during the global financial crisis of 2008. The study further found that growth in the service sectors has been relatively buoyant especially in the financial sector but experienced a decline during the financial crisis. The construction sector was also found to be buoyant in the real sector between 2005 to 2015 but experienced a decline in post 2010. The manufacturing, mining and public sectors experienced a slow-down. The rate of potential growth was found to be considerably slowing down in the economy. The study did not use structural methods as such, did not estimate the effect of labor and other variables that influence output. This study will use the production function and will estimate the effect of skills mismatch on the output gap in Nigeria.

Ghalayini (2019), did a study on the output gap of Lebanon between 1998 and 2015 with data from the World Bank, US Energy Information Administration and Lebanese Centrale Banque. The Cobb-Douglas production function method was used with labor, capital stock, total factor productivity, potential labor, real GDP, money supply (M2), changes in oil prices and labor force as variables. The OLS was used to estimate the model. The study found that the economy was operating beyond its potential and therefore had inflationary problem. There was then the need for policy to ensure a restructuring of the labor market for the economy to revert from its inflationary path. This study will focus on a developing economy like Lebanon and will estimate the effect of skills mismatch on the output gap.

2.3 Overview of literature

This study reviewed various theories related to output and unemployment, output gap and productivity. The Solow-Swan and Okun's law were reviewed. The Solow-Swan theory of growth and Okun's law will be the theoretical basis of

this work. These theoretical positions suggest the variables that are relevant to output growth and productivity and how they affect unemployment and the output gap. The neoclassical theory posits that the use of capital, technology and labor causes growth and, in the long-run, savings also leads to growth. The theory therefore provides for an analysis of the output effect of labor. Okun's law states that GDP changes, affects unemployment. The law was presented in a gap and dynamic form. Because of the problem of omitted variables, the dynamic form was further extended so as to account for the effect of more variables on unemployment besides changes in output.

Various empirical literature had been reviewed. The review reveals that part-time employment effect on productivity was asymmetrical across countries. In Belgium positive and negative effects of part-time employment on productivity were found in separate studies by Garnero, Kampelmann, and Rycx (2014) and Specchia and Vandenberghe (2013). Kunn-Nelen et al. (2013), found positive effects on productivity in the Netherlands while negative effects were found in Germany, Italy and Switzerland by Nielen and Schiersch (2016); Divicienti, Grinza and Vannoni (2018). These studies were at the firm or plant level and were done in developed economies in Europe. This study contributes to literature by focusing on a developing economy in Africa. The unit of study was sectors of the economy as against firms and plants used in literature that are usually not large enough compared to sector-wide information. It also avoids linkage problems that are associated with longitudinal firm level data.

Pitan and Adedeji (2012), Aminu (2019), analyzed skills mismatch effects on unemployment on those with bachelor degree or its equivalent. The studies did not include those with lower levels of academic qualifications. The analysis of

variance and, variance of relative unemployment proportionality index was used for analysis. This study used a regression model and skills mismatch index was measured for all categories of educational levels in Nigeria.

The study by Adamu et al. (2009), was based on the VAR for the period 1980 to 2008 and was on the nature of the output gap rather than labor skill effect on the output gap. This study was for the period 2010 to 2018 and focused on skills mismatch (dissimilarity index) effect on the output gap of Nigeria based on the production function method. The study used additional variables such as oil price, foreign exchange inflow and outflow, lending and inflation rate that were not used in previous studies on the Nigerian economy.

CHAPTER THREE
METHODOLOGY

3.1 INTRODUCTION

This chapter presents the research design, theoretical framework and the methodology that was used in order to achieve the proposed study objectives. Also, the variables used in the study and their measurement, data type, source and diagnostic test were presented.

3.2 Research design

The longitudinal non-experimental research design was used for this study. This is because, the research design involves the study of phenomenon or variable(s) over a period of time such as weeks, months or years and are not subjected to controlled, pre-designed or manipulated environment by the researcher. The influence of extraneous factors that may affect the study and may not be explicitly captured as explanatory variables, but rather in the error terms of the econometric models that was used, had also made this the most suitable research design. Secondary data which was collected through surveys was used for the study (Reio, 2016; Marczyk et al., 2005).

3.3 Theoretical framework

This study was guided by the Okun's law and the neoclassical growth theory that were described in sub sections 3.3.1 and 3.3.2

3.3.1 The neo-classical theory of growth

The neo-classical theory of growth by Solow-Swan (1956) explains output determination based on a production function. The function shows that output produced in an economy is determined by inputs. The inputs used in a simplified

production function are labor and capital. Assuming the production function is of the form

$$Y = F\ (K, A, L) \tag{3.1}$$

Where Y is output, K, A and L are capital, technology and labor respectively. Given that there are constant returns, equation 3.1 can be expressed in per-capita terms as

$$y = f(k) \tag{3.2}$$

where y output per unit of effective labor and k is capital per unit of effective labor. $y = Y/AL$ and $k = \dfrac{K}{AL}$

Assuming a Cobb-Douglas production function of the form

$$Y_t = A_t L_t^\alpha K_t^\beta \tag{3.3}$$

Where α and β are the share of labor and capital.

Equation 3.3 can be expressed in logarithmic form as

$$log Y_t = \log A_t + \alpha \log(L_t) +\ \beta \log\ (K_t) \tag{3.4}$$

3.3.2 Okun's law

This law was developed by Arthur Okun in 1962 in a presented paper on potential GNP: Its measurement and significance that shows an inverse empirical regularity between output and unemployment (Prachowny,1993; Ball et al., 2013). Unemployment and output are inversely related. When there is an increase in output in an economy, there will be a rise in the level of employment or a reduction in the level of unemployment. The law as originally presented by

Okun's was in two versions: the gap and difference versions (Ball et al., 2013; Hutengs & Stadmann, 2013; Apap & Gravin, 2014; Micallef, 2016). The gap version is expressed as;

$$E_t - E_t^* = \gamma(Y_t - Y_t^*) \tag{3.5}$$

$$U_t - U_t^* = \delta(E_t - E_t^*) \tag{3.6}$$

Where E_t is log of employment, Y_t is log of output, U_t is the unemployment rate and U^* and E^* indicates the long-run level or potential. Substituting 3.5 into 3.6 gives

$$U_t - U_t^* = \beta(Y_t - Y_t^*) \tag{3.7}$$

Where $\beta = \gamma * \delta$. Equation 3.7 is the Okun's law that shows the relationship between unemployment and output based on the unemployment and output gap. The difference version is expressed as;

$$\Delta U = \alpha + \beta \Delta Y \tag{3.8}$$

Where ΔU is the change in the unemployment rate, ΔY is the real output growth rate and β is the Okun coefficient. According to Stock and Vogler-Ludwig (2010), because of the problem of omitted variables that may influence unemployment, equation 3.8 has been developed into a dynamic version which includes the lags of real GDP and change in unemployment as;

$$\Delta U_t = \alpha + \alpha_1 Y_t + \alpha_2 Y_{t-1} + \alpha_3 Y_{t-2} + \Delta \alpha_4 U_{t-1} + \Delta \alpha_5 U_{t-2} \tag{3.9}$$

3.4 Empirical models
3.4.1 Part-time employment and labor productivity.

The neoclassical theory of growth was used in order to examine the effect of part-time employment on labor productivity and equation 3.16 was used. This was done following Nelen-Kunn et al. (2013) and Mahy et al. (2015) that used panel data models. Given that we have a heterogeneous (part-time and full-time) labor supply in each sector, equation 3.3 was expressed as

$$Y_{it} = A_{it} L_{it}^{*\alpha} K_{it}^{\beta} \tag{3.10}$$

Where Y_{it} is 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 total (heterogeneous) labor supply in sector i at time t and K_{it} is capital in sector i at time t in Nigeria respectively. Equation 3.10 was converted into logarithmic form as equation 3.11

$$\ln Y_{it} = \ln A_{it} + \alpha \ln L_{it}^* + \beta \ln K_{it} \tag{3.11}$$

Where L_{it}^* is the heterogeneous labor supply in each sector. The adjusted heterogeneous labor input will be

$$L_{it}^* = L_{it}[1 + \gamma pt[PT/L]_{it} + \gamma ft[FT/L]_{it}] \tag{3.12}$$

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 log of equation 3.12 and using $log[1 + x] = x$ the equation becomes

$$\ln L_{it}^* = \ln L_{it} + \ln[1 + \gamma pt * [PT/L]_{it} + \gamma ft * [FT/L]_{it}] \approx \ln L + [\gamma pt * [PT/L]_{it} + \gamma ft * [FT/L]_{it}] \tag{3.13}$$

substituting equation 3.13 into equation 3.11 and dividing the right-hand side of 3.11 by L it becomes

$$ln\left[\frac{Y}{L}\right]= lnA_{it}+\alpha[\gamma pt * [PT/L]_{it} + \gamma ft * [FT/L]_{it}]+\alpha\ lnL_{it} + \beta lnK_{it} \quad (3.14)$$

equation 3.14 in compact form will be

$$y_{it}=\varphi_{it}+ \theta pt_{it} + \sigma ft_{it} + \alpha l_{it} + \beta k_{it} \tag{3.15}$$

The panel model to be estimated becomes

$$y_{it}=\varphi_{it} + \delta x'_{it} + \varepsilon_{it} \tag{3.16}$$

Where lower case letters in 3.15 and 3.16 are in logs. y_{it} is labor productivity 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 labor (total number of employees) and capital importation, the 2015 election dummy, proportion of part-time workers, foreign exchange utilization. Panel model was used and the choice of random effects was determined by the outcome of the Hausman test.

3.4.2 Skills mismatch and unemployment

To determine the effect of skills mismatch on unemployment, the dynamic version of Okun's law was used. Equation 3.17 was used following the work of Dimian et al. (2017).

$$\Delta u_{t-i} = \ \theta + \beta_t y_{t-i} + \gamma_t x'_t + \Sigma_{i=1}^{p}\varphi\Delta u_{t-i} + \ \Sigma_{i=1}^{q}\tau\Delta y_{t-i} + \psi_t \quad (3.17)$$

Where u_t and u_{t-i} is unemployment and lag of unemployment in Nigeria, Y_t is real GDP in Nigeria, x'_t is a matrix of explanatory variables; skills mismatch index, oil price, labor force, youth for Nigeria and p and q are the number of optimal lags for change in unemployment rate real GDP growth rate and ψ_t is

the error term. The Akaike Information Criterion (AIC) was used to determine the optimal lag length. The model was estimated using the ordinary least square (OLS) and CMR stationarity test was done.

3.4.3 Skills mismatch and output gap

In order to investigate the effect of skills mismatch on output gap, equations 3.3 and 3.4 based on the neoclassical theory of growth was used following Makiw et al. (1992), Seetanah & Rajid (2011), Alkhareif et al. (2017).

$$Y_t = A_t \cdot L_t^{\alpha} \cdot K_t^{\beta} \qquad (3.18)$$

Where Y is output in Nigeria, A is total factor productivity for Nigeria, K is capital (gross fixed capital formation) and L is labor for Nigeria.

Equation 3.16 will be augmented with skills mismatch thus;

$$Y_t = A_t \cdot L_t^{\alpha} \cdot K_t^{\beta} \cdot SMI_t^{\gamma} \qquad (3.19)$$

Where SMI is the skills mismatch and $\alpha + \beta + \gamma \leq 1$ Equation 3.19 in logarithm form is;

$$logY_t = logA_t + \alpha logL_t + \beta logK_t + \gamma logSMI_t + \mu_t \qquad (3.20)$$

The measure of total factor productivity, capital stock and an estimate of potential employment (L^*) was used to compute potential output. Hodrick-Prescot (HP) filter was used to estimate the non-accelerated inflationary rate of unemployment (NAIRU) and potential output. Potential employment, which is the noninflationary long-run level of employment was computed thus;

$$L^* = L \cdot (1 - NAIRU) \qquad (3.21)$$

Where L is the labor force.

••

Potential output is given as

$$Y_t^* = A_t L_t^{*\alpha} K_t^\beta \qquad (3.22)$$

The log of potential output (3.22) was subtracted from equation 3.20 which will result in equation 3.23 that was used as the empirical model to determine the effect of skills mismatch on output gap.

$$\Delta c_{t-i} = \alpha_t + \emptyset c_{t-i} + \beta x_{t-i} + \sum_{i=1}^p \Delta c_{t-i} + \sum_{i=1}^q \beta_{2i} \Delta x'_{t-i} + u_t \qquad (3.23)$$

Where C_t is the output gap of Nigeria, x'_t is a matrix of explanatory variables; skills mismatch index, log changes in inventory, log of oil price, lending rate, log of exchange rate, inflation rate and u_t is the error term.

Equation 3.23 was estimated using ordinary least square to determine the effect of skills mismatch on output gap. The variance inflation factor (VIF) was used to determine the presence of multicollinearity and stationarity of the variables was determined using the CMR test.

3.5 Definition and measurement of variables
Table 3.1 gives the definition and measurement of the variables that will be used in the study.

Table 3.1: Definition and Measurement of variables.

Variable	Definition	Measurement
Unemployment(U)	This refers to the persons that are not able to find work and those employed for less than 20 hours a week.	This is measured in percentage as the total number of unemployed persons divided by the labor force and multiplied by a hundred.
Skills mismatch index (SMI)	An index that shows variation in the education/skill acquired and the one(s) needed for employment.	This is measured as an index using the formular $\frac{1}{2}\sum_{i=1}^{3}\lvert\frac{Ei}{E}+\frac{Ui}{U}\rvert$ where E_i is the number of those employed with educational qualification i and U_i number of those unemployed with educational qualification i, E and U are the total number of those employed and unemployed respectively.
Price of oil	The amount at which Nigeria's crude oil sells in the international market.	The dollar amount paid for a barrel of crude oil exported by Nigeria in the international market.
Capital Importation	The amount of capital imported by	This is the amount in dollars invested in some sectors and the

	each sector in the Nigerian economy.	whole of the Nigerian economy by foreigners.
Labor force	The number of persons that are of the working age.	This is measured as the number of persons who have met the minimum criteria for employment in the Nigerian economy which is between 18 and 65 years for mainstream civil servants and 18 and 70 years for Judges and Academics.
Gross fixed capital formation	Assets acquired and produced in an economy.	This is the dollar value of resident producer investments less disposals or depreciation
Youth	Number of persons between ages 15 to 34	This is measured as the number of persons that are between ages 15 and 34 in Nigeria
Election	This is the process of political leadership selection through voting in Nigeria	This is a dummy variable where 1 for the election period and 0 otherwise.
Part-time workers	This refers to those who work for between 20 and 39	This is the number of persons that are employed for a period that is between 20 and 39 hours a week in Nigeria

	hours a week in Nigeria.	
Full-time workers	This refers to those who work for 40 hours and above in a week in Nigeria.	It is the number of persons in Nigeria that for 40 hours and above in a week.
Output gap	This refers to the difference between output produced and potential output of the economy	It is the percentage difference between what is produced in the economy and what could have been produced.
Real GDP Growth	This is the actual output produced in an economy devoid of inflationary effect.	The percentage increase in the actual output of the economy.
Total workers	This refers to those employed as full- and part- time workers in a sector.	It is the total number of persons employed in a sector.
Foreign exchange utilization	This is the amount of money used by a sector for the production of goods and services.	It is the dollar amount used by producers in the various sectors of the economy for the production of goods and services

Labor Productivity	This is the output produced per worker or employee in a sector.	This is measured as the real GDP per sector divided by the total number of workers employed in that sector.
Foreign exchange inflow	This is the amount of foreign currency that flows into the economy due to the export of goods and services.	It is the dollar amount earned in the economy as a result of sale of goods and services abroad
Outflow of foreign exchange	It is the amount of money that leaves the economy as investments abroad, capital flight etc.	This is the dollar amount of money that leaves the economy for other economies.
Lending rate	This is the amount charge on loans and advances issued to economic agents by financial institutions.	It is the percentage charged on loans and advances by lending institutions.
Inflation rate	This refers to the general increase in the prices of goods and services within a given period of time.	It is the percentage increase in the prices of goods and services.

3.6 Data type and source

The study made use of secondary (quarterly) panel data for the period 2012 to 2016 for eight sectors in the first objective, and quarterly time series data for the period 2010 to 2018 for the second and third objectives from various issues of the National Bureau of Statistics of Nigeria (NBS) and Central Bank of Nigeria (CBN). Data from the World Bank (WB), International Labor Organization (ILO) and the Organization of Petroleum Exporting Countries (OPEC) were also used.

3.7 Diagnostic Tests

The Clemente-Montanes-Reyes (CMR), Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) test of stationarity was done on the study variables. The presence of multicollinearity was verified based on the Pair-wise correlation coefficient and the Variance Inflation Factor (VIF). Durbin-Watson and Breusch-Godfrey test of autocorrelation, White's test of heteroscedascity were done.

3.8 Data analysis

To achieve the first objective, the result of the Hausman test was used to determine the model used in equation 3.16, which was the random effects model. The model was estimated using the Generalized Least Square (GLS). To achieve the second objective, equation 3.17 was estimated using the Ordinary Least Squares (OLS). The third objective was achieved by estimating equation 3.23 using the Ordinary Least Squares (OLS) to determine the effect of skills mismatch on the output gap.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 INTRODUCTION

This chapter provides the empirical findings of the study. It begins with the

descriptive statistics of the study variables followed by the diagnostics and the

presentation of results for each study objective.

4.2 Descriptive Statistics

In order to understand the characteristics of the data used in the study, the

standard deviation, mean, maximum and minimum values were computed. Table

4.1 provides the results of the descriptive statistics.

Table 4. 1: Descriptive Statistics

Variable	Measurement	Mean	Maximum	Minimum	Standard Deviation
Skills mismatch	Index	0.691257	0.729000	0.571000	0.026074
Youth	Number	35,940,332	44,229,419	25,971,049	5,751,196
Unemployment	Percent	10.96571	23	4.9	5.238429
Labor force	Number	74,474,078	90,470,592	64,337,005	7,597,904
Real GDP growth	Percent	3.213548	6.880000	-2.240000	2.699945
Output gap	Percent	-7.911374	-7.828868	-8.021239	0.0449552
Proportion of Part-time Workers	Number	0.1577009	0.6208733	0.0217052	0.1943005
Oil price	US Dollars	82.74000	121.2500	33.92000	27.80755
Productivity Per Worker	US Dollars	2,716.40	20,410.94	30.92	5,218.59
Gross fixed capital formation	US Dollars	128,000,000	178,000,000	69,100,000	31,800,000

Table 4.1: Continued

Capital Importation (Sectors)	US Dollars	119,000,000	1,400,000,000	1,000	242,000,000
Foreign exchange utilization	US Dollars	729,000,000	7,900,000,000	10,000	1,550,000,000
Foreign exchange inflow	US Dollars	10,144,400,000	14,708,450,000	3,942,890,000	3,016,737,000
Foreign exchange outflow	US Dollars	10,094,250,000	16,931,360,000	3,646,890,000	3,216,250,000
Capital importation (economy)	US Dollars	3,350,590,000	7,849,070,000	710,970,000	1,953,060,000
Inflation rate	Percent	11.84171	18.6	7.8	3.208605
Lending rate	Percent	25.95429	31.61	21.9	3.061709

Source: Author's computation from study data.

The descriptive result in Table 4.1 show that the mean index of skills mismatch was 0.691 with the maximum and minimum as 0.729 and 0.571. The index is based on different levels of employment and unemployment by educational qualification and it is between zero and one. When the index is zero, there is no difference between skill supply and demand but if it one or 100 percent then labor does not possess the required skill (ILO,2013).

Table 4.1 show that the mean youth population was 35.9 million while the maximum was 44.2and the minimum value was 25.9 million persons respectively. The mean of labor force was 74.4 million persons with a maximum value of 90. 52 and minimum of 64.3 million persons respectively. The nation, based on these numbers has abundant manpower whose skills and abilities can be tapped into for rapid economic development. The labor force and youth trend are presented in Figure 4.1
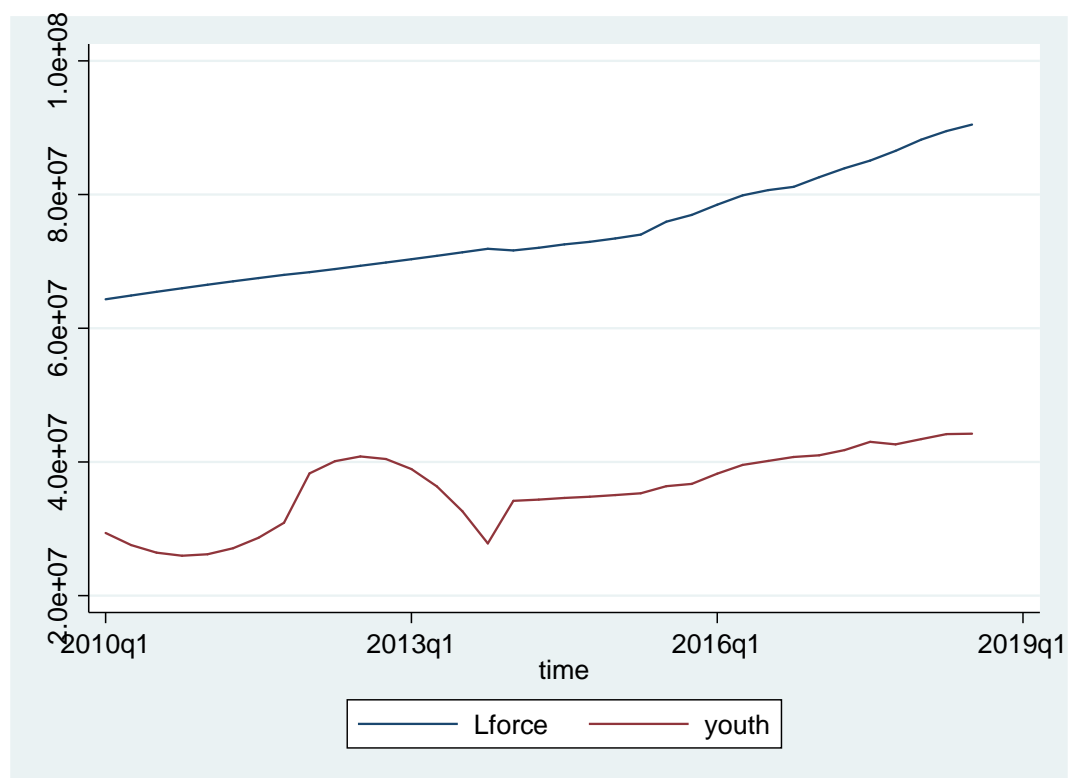
Figure 4. 1: Trend of the number of Youth and Labor force in Nigeria.

Source: NBS Statistical Bulletins (various issues).

Figure 4.1. show that the youth population decreased between 2010 and 2011 but increased in 2012 and had a sharp decline in 2014 which was prior to the 2015 elections that was characterized by insecurity and migration of people to

other countries. The number of persons in the labor force kept increasing within the study period despite the changes in the youth population.

The mean percentage unemployed in the economy was 10.96 while the maximum and minimum percentage unemployed was 23 and 4.9 percent respectively. The mean value shows that not less than one in ten persons is unemployed in the economy.

Oil price which is the main source of government revenue and foreign exchange earnings from Table 4.1 had a mean price of 25.55 USD and the maximum and minimum prices were USD 121.25 and 33.92 respectively. The lowest price was in the first quarter of 2016 which contributed in the economy going into recession in the second and third quarters of 2016 because the price of oil fell by about 50 percent between 2014 and 2016.

Real GDP growth rate was maximum of 6.88 and minimum of -2.24. The median and mean values were 3.61 and 3.21 percent respectively. The minimum value was in the third quarter of 2016 when the economy was officially in a recession. The mean value shows that the nation has not been able to achieve its targeted average annual growth rate of about 6.1 percent.

Table 4.1 show that the nation has been producing below its potential because the mean output gap value was -7.911374 percent. The maximum and minimum values were -7.828868 and -8.021239. These negative values suggest that there is excess capacity in the economy, weak demand and the nation is producing below its potential as such the output gap can be reduced by improving on the level of production in the economy (Nepal Rastra Bank, 2017).

The results of descriptive statistics in Table 4.1, shows that the mean, minimum and maximum values of foreign exchange utilization by sector was 729 million, 10 thousand and 790 million. Building and construction sector had the minimum value in the third quarter of 2016 which was the period of recession. This suggest that the sector's utilization of foreign exchange for production was adversely affected by the recession.

Table 4.1 showed that the mean inflow of foreign exchange was USD 10,144.4 while the mean outflow was USD 10,094.25. This suggest that on the average, there is less outflow of foreign exchange than inflow implying an improvement in the economy due to higher value exports and retention of foreign investments. The maximum and minimum inflow in USD was 14,708.45 and 3,942.89 million dollars while the corresponding values for the outflow USD were 16,931.36 and 3,646.89 million dollars respectively. The mean of economy wide capital importation was 3,350.591 million dollars while the maximum and minimum was 7,849.07 and 710.97 million dollars respectively. The lowest figure was in the first quarter of 2016 just before the economy officially went into recession. The combination of these contributed to the recession of 2016. The trend of these variables is presented in Figure 4.2
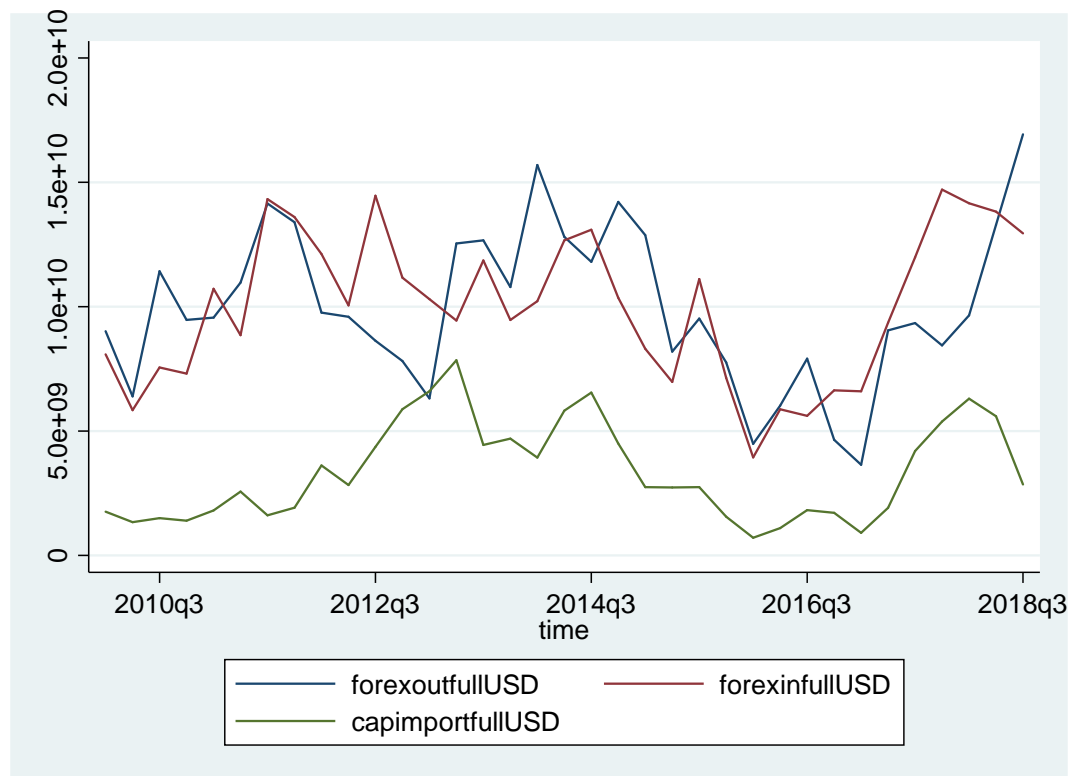
Figure 4. 2: Trend of Foreign Exchange Outflow, Inflow and Capital Importation in Nigeria.

Source: CBN and NBS Statistical Bulletins (various Issues).

Figure 4.2 show that foreign exchange inflow, outflow and capital importation increased between 2010 and 2012 but with some fluctuations in the inflow and outflow of foreign exchange. The period 2012 and 2013 was characterized by fluctuations in the behavior of all the variables. There was a decline between 2014 and 2016, when oil prices declined and there was an economic recession. Capital importation was the lowest between 2010 and 2018. Foreign exchange outflow had increased in 2018 while capital importation and foreign exchange inflow decreased.

4.3 Empirical Result

The study results are presented in sub-sections 4.3.1, 4.4.1 and section 4.6 for the first, second and third objectives respectively. Panel data was used to achieve the first objective while time series data was used to achieve the second and third objectives.

4.3.1 Part-time Employment and Labor Productivity

The first objective of this study was to examine the effect of part-time employment on labor productivity. A long panel data (quarterly) 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 was used, based on the Vision 20: 2020 and the EGRP for the period 2012 to 2016 to achieve the study objective. The supply of disaggregated sectoral employment data by the NBS was available for the period 2012 to 2016 because it was discontinued in 2016. Diagnostic tests such as unit roots, variance inflation and pairwise correlation test, panel random effect test, Hausman test were carried out. The model was estimated using equation 3.16 and the estimated empirical results are presented in Table 4.3.

4.3.2 Variance Inflation Factor and Pair-wise Correlation Tests

Multicollinearity refers to high relationship between two or more explanatory variables in a regression model such that one variable can be predicted with some degree of accuracy by another in the model. According to Gujarati & Porter (2009) was initially used to refer to "perfect" or exact linear relationship among some or all explanatory variables but it is now used in a broader sense that includes imperfect collinearity. Multicollinearity problem inflates standard errors and makes estimation of coefficients in a model less reliable or accurate.

In order to avoid possible multicollinearity problem, the variance inflation factor test was conducted and also Pairwise correlation of the variables. The VIF measures how much the correlation between predictor variables influences the variance of an estimated regression coefficient of a variable with which they are correlated. According to Chatterjee and Hadi (2006), Wooldridge (2016) and Gujarati & Porter (2009) a VIF value of 10 is used as a rule of thumb, where values above 10 suggest the presence of high multicollinearity that is a problem. Wooldridge (2016) further stated that a VIF above 10 does not mean that the standard deviation of the variable(s) is too large to be useful. The result shows a mean VIF value of 1.32 and all the study variables have VIF values that are less than five as shown in Table A2 appendix I.

The Pairwise correlation enables the detection of highly correlated variables that may cause multicollinearity problems. The rule of thumb for the possible existence of multicollinearity according to Asteriou and Hall (2011) that is used my most researchers is 0.9 meaning that variables with correlation coefficient that are above 0.9 could cause serious multicollinearity problem. Gujarati and Porter (2009) stated that high multicollinearity undermines the statistical significance of an independent variable therefore affecting the reliability of the regression results. The pairwise correlation result is presented in Table A3 appendix I. The decision was made such that, the variable with the highest VIF value above 10 was dropped from the model.

4.3.3 Panel Unit Root Test

In order to obtain reliable regression results, the data set was tested for stationarity to find out if the mean and variance do not change with time because changes in the variance and mean, makes generalization to other time periods unreliable. The Im-Pesaran-Shin (IPS) and the Levin-Lu-Chi (LLC) test were done. The IPS null hypothesis is that all panels contain unit roots while the alternative hypothesis is that some panels are stationary. For the LLC, the null hypothesis is that panels contain unit roots while the alternative hypothesis is that panels are stationary. According to Cameron & Trivedi (2009) the null hypothesis of both tests assumes unit roots and is tested against the alternative of homogeneity in the LLC and heterogeneity in the IPS. When the P-value is less than the relevant significant level, the null hypothesis of panel non stationarity will be rejected rather the alternative hypothesis of stationarity will be accepted, meaning that the variable is stationary at levels or I (0). Table A1, Appendix 1 shows the unit root test result.

The result shows that all variables were found to be stationary with trend based on the IPS and LLC test except for IPS of labor productivity. The IPS result shows that, capital imported and foreign exchange utilization were stationary at one percent level of significance, while proportion of part- time workers and number of workers were stationary at ten percent level of significance. The LLC test result shows that labor productivity, number of workers and proportion of part- time workers were all stationary at one percent level of significance while capital imported and foreign exchange utilization were stationary at five percent level of significance. Stationarity decision was made when either test reject the null hypothesis. The variables were all found to be stationary at levels.

4.3.4 Panel Random Effect and Hausmann Tests

Panel data consist of both time series and cross-sectional dimensions because of this it is necessary to determine if the cross sections are the same or not. The panel random effect test was carried out to determine if there are variations or differences across the various cross-sectional units in the panel or not. Breusch and Pagan LM test was done to determine the presence of variations across the cross-sectional entities or not. The null hypothesis of the test is that the variance across entities is zero while the alternative hypothesis states that, there are variations across entities. When the P-value is less than 0.05, the null hypothesis will be rejected. From Table A4 of appendix I, the P-value from the test is 0.000 which is less than 0.05 and therefore the null hypothesis of no variations across entities or units was rejected. This implies that the data is suitable for a panel regression analysis with consideration for the possible heterogeneity of the units.

The Hausman specification test enables the choice of the appropriate model to be made between fixed and random effect(s) model. The null hypothesis is that, the random effects model is consistent while the alternative hypothesis is that the fixed effects model is consistent. The random effects model assumes that the units of study have a common mean value for the intercept and the individual specific effect is uncorrelated with the independent variables. The fixed effects model allows for heterogeneity among the different cross sections there by allowing each unit to have its own intercept. The peculiar attributes of the units do not change across time and are correlated with the independent variable. When the probability value is greater than 0.05 then the random effects model will be accepted as being consistent and most suitable for the study. If the P-value is less than 0.05 then, fixed effects model will be accepted as the most

suitable. The Hausmann test results from Tables 4.2 and A5 of Appendix I show a P-value of 0.636 which is greater than 0.05 and therefore the random effects model was concluded to be the most appropriate model for the study. The estimated result of the random effects model is presented in Table 4.2.

Table 4. 2: Empirical Estimates for the Effect of Part-time Employment on Labor Productivity

Variables	Coefficient	Standard Error	P-value	
Labor productivity per worker				
Election	0.004	0.036	0.914	
Capital importation	-0.019**	0.007	0.011	
Number of workers	-0.944***	0.116	0.000	
Proportion of part-time workers	0.478***	0.120	0.000	
Foreign exchange rate utilization	-0.022*	0.012	0.063	
Wald Chi2(5)= 76.43	P-value = 0.000			
Hausman Test	0.636			
R-squared	Within	0.314		
	Between	0.743		
	Overall	0.738		

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

Source: Author's computation from study data.

The Wald test as for overall significance shows if the explanatory variables used in the model are important or significant in explaining the dependent variable or not. Table 4.2 indicates that the model coefficients were statistically different

from zero because the P-value was less than 0.05. This means that the variables were jointly significant in explaining variations in labor productivity. Also, on the average, the study found that 73 percent of variation in labor productivity is explained by changes in the explanatory variables used in the model.

Table 4.2 show that election was positive but the coefficient was found to be statistically insignificant. The estimated coefficient was 0.004 and P-value was 0.914. The sign was expected because elections are associated with activities such as increased advertisement and employment of part-time staff by politicians, political parties, non-governmental organizations and the institutions charged with conducting elections. Their job is to conduct, monitor and report on the elections. All of these contribute positively to labor productivity. This finding concurs with Heckelman (1998) where gubernatorial elections did not make any significant difference on gainful employment (which affects labor productivity) between states with and those without gubernatorial election. Cahan (2019) found that in states and counties where gubernatorial elections were held, there was growth in government employment at both the local and state levels.

Capital importation had negative effect on labor 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 labor productivity. This implies that as capital was imported into the country, labor productivity reduced. According to the neoclassical growth theory as stated by Solow (1956) fixed technology will result in an inverse relationship between

additional labor productivity and capital (Stundziene & Saboniene, 2019). The importation and adoption of new technology requires learning, devotion of more resources to the new capital, organizational and management restructuring. These changes result in reduced average level of knowledge and productivity that was below its potential thus leading to decrease in output growth rate (Hornstein & Krusell, 1996). Less developed countries according to Grossman & 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 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, & 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 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 & Jonathan (2016) where capital had positive effect on manufacturing productivity of Ghana, Tanzania and Kenya. Bas & Strauss-Khan (2014) also found that capital importation in France had positive effects on firm level productivity also

Halpern, Koren, & Szeidl (2015) found an increase of about a quarter in the growth of Hungarian productivity due to imported capital inputs.

The total number of workers had negative effect on labor productivity and the coefficient was statistically significant. The estimated coefficient was -0.944 with a P-value of 0.000 and was statistically significant at one percent. This implies that all things being equal, an average increase in number of workers by one percent was associated with an average reduction of 0.944 percent in labor productivity per worker. This means that the total number of workers had negative relationship with labor productivity and there was poor utilization of human resources in the economy. This had adversely affected other related factors such as capital (imported) that was also found to be negatively associated with labor productivity. This relationship was because the external and internal work environment of the worker in Nigeria has had negative effect on labor productivity and was unfavorable to the enhancement of labor productivity (Akinyele, 2010).

 Industrial strikes that last for several months by various trade unions such as Academic Staff Union of Universities (ASUU), Nigeria Labor Congress (NLC) and Trade Union Congress (TUC), Nigeria Medical Association (NMA) whose members are full-time workers had resulted in productivity losses. Industrial disputes and strikes in Nigeria were found to be responsible for under-productivity of factor inputs emanating from workers idleness. In a decade the nation had a total of 1654 work stoppages and 32,030,858 man-days loss (Uma et. al, 2013; Ngbuelo, 2021). Educationally, the nation's mean years of schooling was 5.4 years which was less than the six years required for primary education and a budget allocation to education that has been less than eight percent of total

national budget (NBS, 2018; BudgIt, 2017). The quality of education and skills developed in the country implied poor labor productivity because high education and schooling according to human capital theory equips the labor force and increase productivity at the individual and organizational levels (Fredrick, Nancy, & Kit, 2004). Output growth according to Kim & Loayza (2019) is affected by the number of years of schooling and completion rates because educated workers produce more and better.

The level of literacy in Nigeria was 67.7 percent compared to a global rate of 86.47 percent (WB, 2020). Also, the mean number of years of schooling for those between ages 20 and 24 was between 0.07 years and 0.11 years (less than a year and a half). For those between 25 and 29 years old, the tertiary school attendance rate was between 6.0 and 12 percent and completion rates were between 9.0 and 22 percent for a two-year study period. The completion rate for a four- year course of study for the same age group was between 3.0 and 13 percent. For those between 30 to 34 years who studied for at least four years, the completion rate was between 6.0 and 11 percent (UNESCO, 2020).

The proportion of part-time workers had positive effect on labor 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 labor productivity per worker. It therefor means that as more part-time workers were employed, other factors of production were utilized in the economy to facilitate labor 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, shifts not covered by full-time workers and are allocated more efficiently. 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 labor productivity (Borowczyk-Martins,2017; ILO 2016). According to the NBS (2018), during the period 2016 to 2017 when the economy went into 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 labor 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 labor productivity. But Specchia and Vanderbergehe (2013), found a decrease in labor 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 labor productivity as a result of one standard deviation increase in part-time share of workers. Ierodiakonou & 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 & 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 cost and other complexities that is associated with different work arrangements adversely affects prodcutivity.

The utilization of foreign exchange was found to have negative effect on labor productivity. This variable was used to capture the possible effect of naira

devaluation on labor 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 devaluation of 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 labor productivity per worker by 0.022 percent. This means that as the naira value in relation to other world currencies fall, 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 labor and what it can produce.

Olatunde & Jacob (2019) in a similar finding, stated 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 mis-alignment and made round-tripping profitable for economic actors. This had made buying of foreign exchange in the official window and its sale in the parallel market more profitable than engaging in production. This had created serious distortions in the economy with negative effect on the nation's economic growth and its different sectors (Ali et al., 2015).

4.4 Time Series Unit Root Test

Time series data was used to achieve objectives two and three. This type of data set consists of a variable or several variables observed over time (Wooldridge, 2009). The use of this data set requires that various diagnostic test be carried out to avoid spurious results. This means that where a non-stationary series is used in a regression analysis, it can lead to the rejection of a true or acceptance of a

false analysis (Phllips & Xiao, 1998). This section presents unit root test result conducted on the time series variables used for the second and third study objectives.

The Clemente-Montes-Reyes (CMR) test according to Clemente, Montanes, & Reyes (1998) is an extension of the Perron and Vogelsang (1992) statistic to the case of two changes in the mean. The test has two models, the additive outlier (AO) and the innovative outlier (IO). Sudden changes or shocks in the mean of the series is captured by the AO while the IO captures a gradual change or shift in the mean of the series. Clemente, Montanes, & Reyes (1998) demonstrated the reliability of the test with the United Kingdom (UK) and United States of America (USA) long-term real interest rates and showed that they were stationary around a mean with changes at two periods. This study focused on the long-run following Muchai & Muchai (2016) and Kinuthia & Murshed (2015) because the long-run impact of changes can be identified by the IO. The null hypothesis of the test is that the series has a unit root with structural breaks while the alternative is that they are stationary with breaks. The null hypothesis will be rejected in favor of the alternative hypothesis when the absolute value of the t-statistic is greater than the five percent level statistic.

The stationarity test result, presented in Table B1, Appendix II showed that the stationarity of the variables were at levels or I(0) and at first difference or I(1). The I(0) variables were the gross fixed capital formation, the skills mismatch index and capital formation while the I(1) variables were the number of youth, size of the labor force, real GDP and international oil price. This result implies that the Auto Regressive Distributed Lag (ARDL) model will be the most

suitable model for the analysis of both objectives because it allows for the use of stationary or I(0) and nonstationary or I(1) variables simultaneously for analysis.

The result in Table B1, Appendix II showed that skills mismatch index break points were 2013q2 and 2016q1 for the Additive Outlier (AO) and 2010q4 and 2013q1 for the Innovative Outlier (IO). In 2013, the Academic Staff Union of Universities (ASUU) and the Academic Staff Union of Polytechnics (ASUP) and the Nigeria Union of Teachers (NUT) in eleven states went on strike. The ASUU strike lasted for not less than six months (Ugwuona, 2016; Adavbiele, 2015). This interrupted academic activities in the nation's tertiary institutions and the processes of formal high skilled manpower development in the country.

The break points of the AO and IO for oil price was 2015q2,2016q1 and 2014q2,2017q3 these were the periods when the price of crude oil in the international market started declining in 2014, the 2015 election was conducted and the economic recession of 2016.

Gross fixed capital formation AO and IO respective breakpoints were 2013q3,2015q4 and 2013q3,2016q1. By 2015q4, the new government had taken over power and there was a change in government policy. It had a much more restrictive and welfarist focus than what obtained in the previous administration. Also, the price of oil was falling and the economy went into a recession in 2016.

The real GDP growth rate break points for AO and IO respectively were 2015q3,2017q3 and 2012q4,2014q3. These periods corresponded with the time the price of crude oil in the international market fell, which had adverse effect on the economy that contributed to a recession in 2016. It was also the period

when the country held presidential election that bought in an opposition party into government.

Capital importation had AO and IO breakpoints in 2012q2, 2015q2 and 2012q1, 2015q2. The 2012 period was when the price of oil in the international market fell while in 2015, the economy was shut down by the government due to the general elections.

The foreign exchange inflow AO and IO break points were 2015q1,2017q1 and 2015q3, 2017q1. In 2015 the price of oil fell by about 50 percent and in 2017 the government introduced the Economic Growth and Recovery Plan (EGRP) that was a departure from some of the programs and policies of the previous administration.

The outflow of foreign exchange AO and IO break points were 2013q3,2015q3 and 2012q4, 2015q3. The break points in 2015, correspond to the period of the fall in the price of crude oil that is a major source of foreign exchange earnings in the country.

The output gap AO and IO break points were 2015q2,2016q3 and 2015q1,2016q4. They were the periods of the 2015 election and the fall in the price of oil by about 50 percent and the recession of the economy in 2016.

4.4.1 Skills Mismatch and Unemployment

The second objective of the study was to determine the effect of skills mismatch on unemployment. To achieve this objective quarterly time series data was used and because the economy was rebased in 2010, there was no economic growth data for 2010 as such, data from the first quarter of 2011 to the third quarter of 2018 was used. Diagnostic tests such as variance inflation factor (VIF), pairwise

correlation, bounds cointegration, autocorrelation and homoscedasticity tests were carried out to ensure reliability of the estimates. Equation 3.17 was estimated using ARDL model and the result is presented in table 4.3.

4.4.2 Variance Inflation Factor and Pairwise Correlation Test

The VIF according to Gujarati and Porter (2009) is used as an indicator for the presence of multicollinearity that can impair the reliability of estimated coefficients. The larger the VIF the more collinear or problematic the multicollinearity problem and if the VIF exceeds 10 then there is high collinearity which means that the regression coefficients have large standard errors and the coefficients cannot be estimated with high level of reliability.

The correlation coefficient shows the relationship between variables. A large correlation coefficient means that the problems of multicollinearity might emerge and "most researchers consider a value of 0.9 as the threshold beyond which problems are likely to occur" (Asteriou & Hall, 2011: 101). Results from Tables B2 and B3 in appendix II showed that the individual VIF values of all variables were less than 10 while the mean VIF was 4.21 and the pairwise values were within acceptable range. This implied that the results do not suffer from multicollinearity problems. Variables with the highest VIF values above 10 were dropped from the model in order to avoid the problem of multicollinearity.

4.4.3 Bounds Cointegration Test

The bounds cointegration test by Pesaran and Shin (1999) is a test that determines if variables have long-run relationship and can be estimated with an ARDL model. This is because the ARDL model is suitable for estimating variables that are stationary at level and at first difference simultaneously

without pre-specifying their levels of stationarity. According to Nkoro & Uko (2016), the ARDL model is robust when there is long-run relationship among variables in small samples, and cointegration is a way of detecting the presence of steady state equilibrium between variables. The absence of cointegration provides spurious or meaningless results if the model is used. The test provides that if the F-statistics is greater than the upper bound then there is cointegration and if it is less than the lower bound then there is no cointegration at the relevant significance level. When the F-statistic is between the upper and lower bounds then it is inconclusive and the order of integration will be ascertained before inferences are made. The test was carried out to determine the presence of long-run relationship between the variables in the model. The result of the bounds test from Tables 4.4 and B4 in appendix II, showed an F-statistic of 5.106 which was greater than the upper bound values of 3.13, 3.50, 3.84 and 4.26 at 10, 5, 0.25 and 0.1 percent level of significance. This therefore implied that the null hypothesis of no long-run relationship among the variables was rejected at the five percent level of significance. The Auto Regressive Distributed Lag (ARDL) model with lags (2,2,1,1,2,0,2) based on AIC criteria was estimated.

4.4.5 Autocorrelation, Homoscedasticity and Specification Error Tests

Autocorrelation test, is a test of serial independence between error terms from one period to another and when it is violated then the disturbances are not pairwise independent. This is most likely to occur in a time series framework. Autocorrelation problem render estimators inefficient and the variance biased and inconsistent which makes hypothesis testing invalid (Asteriou & Hall, 2011). The Durbin Watson test for autocorrelation was carried out. The null hypothesis of the test is that, there is no autocorrelation while the alternative

hypothesis is that, there is autocorrelation. As a rule of thumb, if the value of d-statistic is close to two, it indicates evidence of no autocorrelation while values close to zero indicate positive serial autocorrelation. Evidence of negative serial correlation will be found when d-statistic is close to four. Table B5 in appendix II showed that the test d-statistic was 2.29 which is close to two and it implied the absence of autocorrelation problem. Asteriou and Hall further stated that due to the possibility of an inconclusive result from the Durbin-Watson test, its inapplicability when there are lagged variables and its inability to account for higher order serial correlation, a more reliable test is the Breusch (1978) and Godfrey (1978) LM test. The null hypothesis of the test is, there is no serial correlation. When the P-value is greater than 0.05, it implies that there is no presence of serial correlation. From Table B5 in appendix II, Breusch-Godfrey LM test for autocorrelation had a P-value of 0.1365 which was greater than 0.05. The presence of serial correlation was therefore rejected at the five percent level of significance.

Homoscedasticity test was carried out to verify if the variances are spread equally or not. The White's test was used and the test null hypothesis is that, the variance is equally spread (homoscedasticity) while the alternative hypothesis is that the spread of the variance is unrestricted (heteroscedasticity). When the P-value is greater than 0.05 the null hypothesis of homoscedasticity cannot be rejected. Table B5 in appendix II showed a P-value of 0.4140 which was greater than 0.05 and therefore the assumption of homoscedasticity was not rejected at the five percent level of significance.

The estimated model was linear and to verify if it was not mis-specified due to omitted variable(s) that can affect the reliability of the estimates, and result in

incorrect conclusion of the relationship between variables in the model, the Ramsey RESET test was done. The null hypothesis of the test is that the model has no omitted variables. If the P-value is found to be statistically insignificant, the null hypothesis cannot be rejected. Table B5 Appendix II showed that the test P-value was 0.4178 and was statistically insignificant, therefore the null hypothesis of no omitted variables cannot be rejected. The stability of the model was tested by the cumulative sum (CUSUMQ) of squared and from figure B1 in Appendix II, the model was stable within the 5 percent bound. The empirical result of the ARDL model is presented in Table 4.3

Table 4. 3: Empirical Result for the Effect of Skills Mismatch on Unemployment

Variables Unemployment	Coefficient	Standard Error	P-value
Youth	2.315***	0.474	0.000
Real GDP	-0.069*	0.037	0.082
Skills Mismatch	13.607**	5.814	0.036
Labor force	0.003	1.563	0.998
Gross fixed capital formation	-0.317	0.259	0.243
Oil price	0.989***	0.329	0.010
Bounds test	F = 5.106	t = -3.295	
R^2	0.8684	Adjusted R^2	0.7065
F	79.12		
Prob>F	0.000		

Note:***,**,* denote significance level at 1percent, 5 percent, 10 percent respectively.

Source: Author's computation from study data.

The result in Table 4.3 indicates that R^2 and adjusted R^2 were 86.84 and 70.65 percent respectively. The result implied that 86.84 percent of changes in unemployment were explained by the explanatory variables used in the model. The F-statistic shows the joint statistical significance and suitability of explanatory variables used in the linear regression model compared to an alternative model without explanatory variables. When the P-value is less than 0.05 then the model is suitable and the explanatory variables used were relevant

in explaining the dependent variable. The F-value was 79.12 and the P-value was 0.000 which was less than 0.05. This means that the variables used in the study were jointly significant in explaining the dependent variable. The null hypothesis that all slope coefficients are equal to zero was not accepted.

The number of youths was found to have positive effect on unemployment. The estimated coefficient was 2.315 and the P-value was 0.000 which was statistically significant at one percent. This implied that, all things being equal, an average increase in youth population by one percent will be associated with an average increase in the unemployment rate by 2.315 percent. This means that the number and ability of young people was not being optimally utilized in the production of goods and services in the economy. Unemployment in Nigeria, according to NBS (2018,2020) was highest among the youth at 29, 30.5 and 29.7 percent in the first three quarters of 2018 and 34.9 percent in the second quarter of 2020. ILO (2013,2017) stated that global financial crisis, inexperience, conflicts, time spent in education especially in developing countries, adverse labor market conditions, inadequate decent work opportunities and an educational system that does not emphasize technical market-relevant skills are reasons for youth unemployment. Baah-Boateng (2016) found that in Africa, demographic bulge in youth population and poor economic growth are key drivers of youth unemployment. This study finding concurs with the position of the ILO (2019) that unemployment is predominantly a youth related challenge because global youth unemployment was 11.8 percent and about 59.3 million youth were unemployed in 2018.

The growth in real GDP was found to have negative effect on unemployment. The estimated coefficient was -0.069 and the P-value was 0.082 which was

statistically significant at 10 percent. This implied that, all things being equal, an average increase in real GDP by one percent will be associated with a reduction in unemployment by 0.069 percent on average. This meant that as more goods and services were produced in the economy, employment opportunities were created and more people were employed due to better utilization of resources. This finding is in line with Okun's law, which states that the relationship between unemployment and economic growth is inverse.

This finding is similar to Amor & Hassine (2017) that found a decrease in unemployment in Saudi Arabia as a result of an increase in economic growth also, Zaleha et al.,(2007), found that an increase in GDP also reduces unemployment. Dimian et al. (2017) found that unemployment reduces by 0.704 with an increase in GDP in European Union Countries in the long-run. Contrary findings were made by Moroke, Leballo & Mello (2014) that found a positive relationship between unemployment and economic growth in South Africa. Aktar et al. (n.d) also found that growth in GDP does not reduce the unemployment rate in Turkey. According to Ball, Leigh, & Loungani (2017) and Hanusch (2013) different findings in countries are due to the idiosyncratic features of national labor markets with regards to labor market institutions, the ease of hiring and firing labor which affects the responses of labor market to growth.

Skills mismatch had a positive effect on unemployment. The estimated coefficient value was 13.607 and the P-value was 0.036 which was statistically significant at five percent. This implied that, all things being equal, an average increase in skills mismatch by one percent will be associated with an average increase in unemployment by 13.607 percent. This meant that as more manpower

was developed in the country without the relevant skills needed for employment, unemployment in the economy had continued to increase and more manpower remained underutilized. This finding was expected because when labor does not possess the needed skills, employers will have no need for their labor services.

Similar finding by Da Silva (2017) showed a significant relationship between skills mismatch and skilled unemployment in Morocco. Edokpolor (2018) also found that skills mismatch had contributed to the alarming rate of unemployment, underemployment and dropout rates of business education students in Nigeria. Dimian et al. (2017) study found a significant long-term positive impact of mismatches on unemployment in the European Union. Also, Humal (2013) found in Sweden a significant positive association between skills mismatch and unemployment, where unemployment increases by between 0.17 to 0.26 percent as a result of a one percent increase in skills mismatch. Similarly, Manacorda and Petrongolo (1999) found that skills mismatch was responsible for an increase in unemployment in Britain of between 28 to 45 percent across different wage settings. According to the ILO (2013) skills mismatch has been adding to the global unemployment problem especially youth unemployment. Due to skills mismatch, society is losing the valuable skills of the youth and forfeiting stronger productivity growth. Economic shocks, improvement in technology and changes in production structure and organizational practices are some reasons for skills mismatch (McGowan & Andrews, 2017).

Labor force coefficient was found to be statistically insignificant. The estimated coefficient was 0.003 and the P-value was 0.998. The positive sign was expected because as the size of a country's labor force increase without corresponding increase in employment generation, there will be an increase in unemployment.

Moreover, according to the ILO (2019), due to expanding labor force, global unemployment is expected to increase by one million every year and will reach 174 million in 2020. This finding was because of the people that have been discouraged from actively seeking jobs, the number of those in school and those who decided to be full-time house wives and are not seeking employment (NBS, 2018).

Gross fixed capital formation coefficient was found to be statistically insignificant. The coefficient was -0.317 and the P-value was 0.243. The negative sign was expected because as investment increase through the purchase, use and sale assets in an economy, it is expected that unemployment will reduce because of new jobs that will be created (Rowthorn, 1995). This finding implied that the purchase of assets in the economy did not significantly reduce unemployment but had the potential to reduce unemployment if properly harnessed and utilized. This was as a result of investments in natural resources such as oil that does not have significant linkage effect with the rest of the economy. Pasara & Garidzirai (2020) found a significant inverse relationship between gross capital formation and unemployment because investors find economies with high unemployment as good prospects for cheap labor.

Oil price was found to have positive effect on unemployment. The coefficient was 0.989 and the P-value was 0.010 and was statistically significant at one percent. This implied that, all things being equal, an average increase in the price of oil by one percent was associated with an average increase in unemployment by 0.989 percent. It meant that the nation had higher underutilization of labor as the price of oil increased in the international market. This was not what was expected for an oil dependent economy because an increase in the price of oil

meant greater revenue for public investment and employment generation. This finding was because of the phenomenon of natural resource curse; a situation where nations blessed with natural resources experience economic backwardness, internal strife and violence. In Nigeria there has been the Niger-Delta crisis, Boko Haram crisis and power repression that led to about 8 successful coups in the country beside aborted ones. These factors coupled with corruption had made it difficult for long-term investments that would have generate employment opportunities, despite the fact that Nigeria is the 8th largest exporter of oil in the World (Caselli, 2006). According to Sala-i-Martin and Subramanian (2012) oil and minerals had negative and deleterious impact on the Nigerian economy. In Sudan, Kelbert (2011) found that oil had negatively impacted the economy because it fueled conflicts, inequalities and plummeted the human development index of the country. UNECA (2015, 2016), stated that, due to illicit financial flows (IFF), Africa had lost an estimated 854 billion to 1.8 trillion USD between 1970 and 2008 while annually it losses an average of 50 to 148 billion USD and Nigeria is one of the main resource rich countries that is a source of IFF from Africa. According to Raheem & Adeniyi (2015) illicit capital flows from Nigeria between 2000 and 2010 in constant 2010 USD was 195.5 billion and between 1970 and 2010 it was 311.4 billion which would have been used for investments and employment creation in the economy.

4.5 The Output Gap

Output gap is the difference between the actual output and the potential output in an economy. A positive output gap means that the economy is having inflationary problems while negative output gap implies under-utilization of resources or an economy with low demand. Output gap reduces when economic growth or output increases and increases when economic growth or output falls.

Table 4.1 indicated that the Nigerian economy was found to have a negative output gap or is producing below its potential output within the study period with a minimum and maximum gap values of -8.021 and -7.829 percent respectively. The output gap of -8.021 percent was in 2016 when the economy went into a recession. The economy could not attain the targeted growth rate of not less than six percent within the study period. This is similar to the findings of below potential output level of production in Brazil by da Silva Filho (2002). Also, Cerra and Saxena (2000) found a negative output gap of -5.5 percent in Sweden. Njuguna et al. (2005) found a mix of positive and negative output gap in Kenya. Alkerhareif et al., (2017) found positive output gap between 2011 and 2015, and negative output gap between 1980 and 2015 in Saudi Arabia.

The negative output gap implied that the Nigerian economy was producing below its full capacity and was underutilizing its capital, technology and labor force and therefore, the economy will be associated with high unemployment and lower wage pressures (Pitambar, 2010; Central Bank of Malaysia, 2012). It also meant that the level of demand in the economy was low and the economy had no inflationary problem but rather a weak demand. The negative output gap was also due to low investments relative to depreciation, low quality of workforce, inadequate technological advancement and poor governance that contributes to poor productive capacity of the economy (Pitambar, 2010). The uncertainties that accompanied the 2015 elections, the activities of armed bandits and killer herdsmen which did not allow farmers to cultivate their land for agricultural purposes coupled with inadequate power supply, the economic recession of 2016 and the Boko haram insurgency had contributed to the economy producing below its potential. This seems obvious in Nigeria given that

unemployment rate in the economy increased from 6.4 percent in the fourth quarter of 2014 to 27.1 percent in the second quarter of 2020 (NBS, 2020).

4.6 Skills Mismatch and Output Gap

The third objective of the study was to investigate the effect of skills mismatch on output gap. Time series data was used from the first quarter of 2010 to the third quarter of 2018 because there was no skills mismatch data for the fourth quarter of 2018. Diagnostic tests such as unit roots, bounds cointegration, pairwise correlation, autocorrelation and heteroscedasticity tests were carried out to avoid spurious regression results. To achieve this objective equation 3.23 was estimated with an ARDL model of lags (2,1,2,2,2,1,2,2,2) based on AIC selection criteria and the result is presented in Table 4.4.

4.6.1 Variance Inflation factor and Pairwise Correlation Tests

The VIF test shows the extent to which the variance and standard errors are affected due to the level of influence of inter-relationship among the explanatory variables. VIF values that are above 10 are considered as a rule of thumb to be problematic and will make the results obtained not reliable. The result in Table C1 Appendix 3 showed that the individual VIF values of all variables were less than ten with a mean VIF value of 3.68. Pairwise correlation shows the degree of relationship between variables used in the model. The correlation coefficients that are 0.9 and below according to Asteriou and Hall (2011) are, as a rule of thumb acceptable by most researchers and considered not problematic. The Pairwise correlation values in Table C2, Appendix 3 are within the acceptable range of the rule of thumb.

4.6.2 Bounds Cointegration Test

The ARDL model combines variables that are stationary at level and at first difference in a regression model simultaneously. It is therefore necessary to determine if the variables have long-run relationship or not. The bounds cointegration test developed by Pesaran and Shin (1999) was used to find out if the variables in the study are cointegrated and therefore have a long-run relationship. The ARDL Bounds test makes use of an F-statistic and a t-statistic to determine the existence of long-run relationship among variables jointly used in an ARDL model. When the F-statistic is greater than the upper bound then the variables are cointegrated and there is a long-run relationship and if it is less than the lower bound then there is no long-run relationship. F-statistic value that is between the lower and upper bound implies an inconclusive result. The result in Tables 4.4 and C3 in appendix III, showed that the bounds cointegration F-statistic was 11.351 which was greater than the upper bound critical values of 3.13, 3.50 and 3.84 at 10, 5 and 2.5 percent levels of significance respectively therefore the variables were concluded to be cointegrated and have a long run relationship.

4.6.3 Autocorrelation, Homoscedasticity and Specification Error Test

Durbin-Watson test of autocorrelation was conducted and from Table C4 in appendix III, the d-statistic was 2.0292 while the Breusch-Godfrey LM test was 0.6246 which was greater than five percent therefore the assumption of the presence of autocorrelation was therefore not accepted at the five percent level of significance. The White's test for the presence of heteroscedasticity showed a coefficient P-value of 0.4180 and therefore the assumption of the presence of heteroscedasticity was rejected. To test for specification errors or the possible

problem of omitted variable, Ramsey RESET test was done. The null hypothesis of the test is that the model has no omitted variables. If the probability value is statistically significant, the null hypothesis will be rejected. The test probability value was 0.8629 which is statistically insignificant as such the null hypothesis of no omitted variables cannot be rejected. CUSUM squared from Figure C1 in appendix III showed that the model was stable within the five percent bound. The empirical result of the ARDL model is presented in Table 4.4

Table 4. 4: Empirical Result for the Effect of Skills Mismatch on Output Gap.

Variables	Coefficient	Standard Error	P-value
Output gap			
Skills mismatch	-0.587***	0.170	0.009
Foreign exchange inflow	-0.018	0.022	0.417
Foreign exchange outflow	-0.027	0.021	0.240
Oil price	0.035*	0.019	0.096
Capital formation	0.070*	0.032	0.061
Capital importation	0.037***	0.009	0.006
Lending rate	0.009**	0.003	0.011
Inflation rate	0.002	0.003	0.380
Bounds Test	F = 11.351	t = -8.036	
R^2	0.979		
Adjusted R^2	0.916		
F	12.62		
Prob>F	0.000		

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

Source: Author's computation from study data.

Table 4.4, the R^2 and adjusted R^2 are 97.9 and 91.6 percent respectively. The R^2 shows the extent to which explanatory variables in a model explain changes in the dependent variable. This result implied that 97.9 percent of the changes in output gap was explained by the explanatory variables used in the model. The F-

statistic showed an F-value of 12.62 and a probability value of 0.000. The probability value of 0.000 which was less than 0.05, meant that the explanatory variables used in the study were jointly significant in explaining the dependent variable. The null hypothesis that all slope coefficients are equal to zero was rejected.

Skills mismatch had a negative effect on output gap and the coefficient was found to be statistically significant at one percent. The estimated coefficient was -0.587 and the P-value was 0.009. This implied that, all things being equal, an increase in skills mismatch by an average of one percent will be associated with an average increase in the output gap by 0.587 percent. This meant that the ability of the nation to increase production and better utilize resources that will boost growth and reduce the output gap was undermined because of skills mismatch.

According to Pitambar (2010) decrease in a nation's labor quantity and quality will further widen the gap between actual and potential output. There was also the problem of labor getting stuck in low wage paying jobs, unsustainable informal sector employment, micro or self-employment or sole proprietorship business from which low-level income is generated and therefore leading to weak demand in the economy. Due to the small and fragile nature of these activities and the level of skill requirement, the output produced is usually low which contributes to below potential production in the economy. In 2017, 65.82 percent of labor in Nigeria was self-employed which does not require high level skills and the level of output from such economic activities were usually low (NBS, 2017). This finding concurs with that of McGowan & Andrews (2015) who found that skills mismatch adversely affected the level of output in OECD countries while Haskel and Martin (1993) also found that the level output in the

United Kingdom was adversely affected by skills mismatch. These findings imply that the economies were producing below their potential due to the difference between skills supplied and demand, thereby increasing the output gap.

The inflow of foreign exchange was positive but statistically insignificant. This meant that foreign exchange flows into the country through exports, remittances, overseas development assistance, external debts can improve economic growth and reduce output gap. A similar finding was made by Chimere, Ihedinmma, & Omenihu (2017) where, capital inflow was found not to have significant impact on growth in Sub-Saharan Africa countries. Ale, Akter, & Islam (2018) found an increase in economic growth (reduction in output gap) as a result of the inflow of remittances in Bangladesh, India but not Pakistan. This finding according Chimere, Ihedinmma, & Omenihu (2017) was because of planning and legislative deficiencies. The fall in oil price in 2012 and 2014/15 due to the nation's dependence on oil as its main source of foreign exchange earnings and corruption in the economy had adversely affected economic growth. Crude petroleum and gas made up about 92 percent of Nigeria's exports value in 2016 as such, falling export commodity prices such as oil, led to declining inflow of foreign exchange and its contribution to the economy also, the fall in remittances into Africa from 4.4 percent of GDP in 2014 to 3 percent in 2015 was a contributory factor (UNECA,2018).

The outflow of foreign exchange was negative and the coefficient was found to be statistically insignificant. The estimated coefficient was -0.027 and the P-value was 0.240. The negative sign was expected because as capital flows out of a country, less resources will be available for the production of goods and

services. Negative impact on growth, which increases the output gap due to capital flight was found in Sub-Sahara African countries (Raheem & Adeniyi, 2015). Lipsey (1994) and Lin & Wang (2008) found that as firms make investments abroad, it leads to an increase in job creation because of more hands that will be employed in the head offices for more research and the need to maintain global market share. Firms, as a result of limited resources necessitated by the outflow will innovate and devise means of better utilizing the available scarce resources through organizational restructuring, more efficient work arrangements and improved use of available technology. According to Raheem & Adeniyi (2015) political factors, macro-economic mismanagement and policy distortions were reasons for such effects.

Oil price coefficient had a positive effect on output gap and the coefficient was statistically significant at 10 percent. The estimated coefficient was 0.035 and the P-value was 0.096. This meant that a one percent average increase in the price of oil, all things being equal, was associated with an average decrease in output gap by 0.035 percent. The positive sign implied that the price of oil was associated with a reduction in the output gap or an increase in output. The significant result was expected because of the dependence of the economy on oil. The result implied that, with crude oil price increase, the economy makes more revenue that contributed to economic growth or a reduction in output gap. This study finding is different from that of Alkhareif et al. (2017) that found an increase in the potential GDP which means an increase in the output gap by 2.4 percent in the oil rich country of Saudi Arabia.

Capital formation had positive effect on output gap and the coefficient was statistically significant at 10 percent. The estimated coefficient was 0.070 and

the P-value was 0.061. This implied that, all things being equal, an average increase in capital formation by one percent was associated with an average decrease in output gap or an increase in demand by 0.070 percent. This meant that the economy's output was increased by the additional capital that was formed and the output gap reduced. This is in-line with the positive role of capital in facilitating economic growth in the exogeneous Solow-Swan (1956) neoclassical model. Similar study findings were made by Pasara & Garidzirai (2020) in South Africa and Adeola & Amr (2020) in 21 African countries where both studies found that there was a reduction in output gap because of the positive relationship between economic growth and capital formation in the long-term. Srinivasakumar, Renganathan, & Vijayabanu (2015) also found the correlation between capital formation and economic growth in India to be positive and significant which implied a reduction in the output gap because of the positive effect of capital formation on economic growth. Ajose (2018) found a negative but insignificant relationship between capital formation and economic growth in Nigeria. This implied that capital formation had no significant effect on output gap in the country. The difference in findings according to Hurnik and Navratil (2005) was due to the economy's level of efficiency, poor usage of investments in their original purpose and the inability to reallocate resources by the economy.

Capital importation had a positive effect on output gap and the coefficient was statistically significant at one percent. The estimated coefficient was 0.056 and the P-value was 0.000. This implied that an average increase of one percent in imported capital was associated with a decrease in the output gap (increase in growth) by 0.056 percent. This meant that imported capital contributed to better

utilization of resources in the economy and facilitated economic growth thereby reducing output gap. Theoretically capital importation is useful for achieving economic growth because it augments domestic capital in the production process. This finding is in-line with the two-gap model of Chenery and Strout (1966) where foreign capital fills the savings and foreign exchange gap in an economy. Similar positive and significant effect by capital inflow was found on growth, which implied a reduction in output gap in Nigeria (Ikpesu, 2019). Mowhei (2018) also found that in 26 African countries, economic growth was positively affected by capital inflows, meaning that output gap was reduces with increase in capital flows but Ogbokor (2001) found that capital importation was not an important variable that explains economic growth in Nigeria that is, it had no significant effect on output gap in the country. According to Baily (1981) at the industrial level capital shows discrepancies but at the aggregate level, it is correlated with labor productivity.

Lending rate had a positive effect on output gap and the coefficient was statistically significant at five percent. The coefficient was 0.009 and the P-value was 0.011. This implied that, all things being equal, an increase in lending rate by one percent was associated with an increase in economic growth or a reduction in output gap by 0.009 percent. This was not as expected by the study. This finding was because the government had made available cash and material loans at single digit interest rate of not more than 9 percent through various programs to other economic agents. These programs include, the Agricultural Credit Guarantee Scheme Fund(ACGSF), Nigeria Incentive-based Risk Sharing System for Agriculture Lending (NIRSAL), Commercial Agric Credit Scheme (CACS),Agricultural Credit Support Scheme (ACSS), Interest Drawback

program (IDP), Power and Airline Intervention Fund (PAIF), Small and Medium Enterprises Credit Guarantee Scheme (SMECGS), SME Restructuring and Refinancing Fund (RRF), Real Sector Support Facility (RSSF), Nigeria Electricity Market Stabilization Facility (NEMSF), the anchor borrowers' program, the youth with initiative program, the national poverty eradication scheme program, skill acquisition programs by the NDE and ITF where participants are given start-up loans at single digit interest rate(Central Bank of Nigeria, 2015, 2018).

Inflation rate was found to be positive but statistically insignificant. The coefficient was 0.002 and the P-value was 0.380. The positive sign was not expected by the study because higher prices are expected to result in weakened or lower demand that will increase the output gap. According to Sumon & Miyan (2017) and Ume et al., (2016) low inflation is positively related to growth and can accelerate growth but that does not mean that it is good for an economy beyond a given level. Samson (2019) found that inflation rate in ECOWAS and COMESA regions had insignificant effect on long-run economic growth which implied and insignificant effect on output gap. Sharma, Kautish, & Kumar (2018) also found an insignificant long-run effect of inflation on economic growth and by implication output gap of India. Sumon & Miyan (2017) found a positive and significant relationship between inflation and economic growth in Bangladesh. Kasidi & Mwakanemela (2013) found a negative relationship in Tanzania between economic growth and inflation. These findings were as a result of the different levels or thresholds of inflation in the countries studied.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Summary

The main objective of this study was to find out the effect of part-time employment on labor productivity and skills mismatch effect on unemployment and output gap in Nigeria. The government had over the years focused on boosting output in the economy to make it attractive to both domestic and foreign investors through different forms of incentives and to boost skills by improving on education and reduce unemployment in the economy. In the vision20:2020 document and the EGRP (2017-2020) the agricultural, manufacturing, mining and quarrying, hotel and accommodation, transportation, building and construction, financial and trade were identified as key sectors for achieving the desired growth in output. The government had over the years focused on reduction in unemployment through various programs and had established institutions such as the NDE with the aim of implementing these programs that would lead to job creation and unemployment reduction. All of these were aimed at more efficient utilization of resources in the economy.

The nation also focused on skilled manpower development in order to eliminate skills mismatch through the establishment of the ITF. The ITF was established to facilitate skills development in all sectors but with greater emphasis on the industrial and engineering sectors. Despite this, the nation had a situation where the economy grew but did not generate jobs for the unemployed between 2011 and 2015. Instead of a reduction in part-time employment as envisaged by policy makers, it had increase over the years.

The NDE was established to tackle the problem of unemployment. Government at the federal, state and local level had launched various poverty and

unemployment reduction programs as envisaged by policy makers. Despite these programs, unemployment in the country increased over the years while labor productivity, rather than increase, it decreased in the economy by about six percent. A determination of part-time employment and skills mismatch effect on labor productivity, unemployment and output gap will enable policy makers come up with comprehensive plan on boosting labor productivity and output, reduce unemployment and output gap.

The first objective of the study was to examine the effect of part-time employment on labor productivity per worker. This centered on eight formal sectors of the economy and therefore differs from previous studies that focused on firms and plants mostly in the manufacturing sector rather than several sectors. While in the second objective, it used a measure of skills mismatch that was not applied by previous studies on unemployment and skills mismatch in Nigeria. In the third objective, the study went beyond labor effects on output gap as obtained in previous studies to skills mismatch effect on output gap.

To examine the effect of part-time employment on labor productivity, panel data was used and the random effects model was found to be the most appropriate model based on the Hausman test that was conducted. The study found that part-time workers, capital importation, total number of workers and foreign exchange utilization coefficients were statistically significant in explaining labor productivity. It found that an increase in the proportion of part-time workers was positively associated with an increase in labor productivity, all things being equal. Capital importation was found to be negatively associated with labor productivity where an increase in imported capital by one percent was associated with a reduction in labor 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 labor productivity. An increase in both the total number of workers and foreign exchange utilization was found to be associated with a reduction of labor productivity, all things being equal. Election coefficient was found to be statistically insignificant in affecting labor productivity.

To find out the effects of skills mismatch on unemployment, an ARDL model was used. This was because the variables were found to be integrated of different orders and estimates from the model based on the different stationarity features of the data will still be reliable. The study found that in the long-run real GDP was negatively associated with unemployment and the coefficient was statistically significant. That is, an increase in the nation's GDP was associated with a reduction in unemployment, a finding that is in-line with Okun's law.

Skills mismatch was found to be positively associated with unemployment and the coefficient was statistically significant. An increase in skills mismatch was found to be associated with an increase in unemployment in the economy, all things being equal. The size of the labor force was found to be statistically insignificant while the number of youths was statistically significant and positively associated with unemployment. This imply that when the number of youths in the economy increased, there was an associated increase in unemployment, all things being equal. Oil price was also found to be positively associated with unemployment and the coefficient was statistically significant. This implies that, all things being equal, oil price increase was associated with a rise in unemployment. Gross fixed capital formation was found to be negatively associated with unemployment but the coefficient was statistically insignificant.

The third study objective was to investigate the effects of skills mismatch on output gap and it was found that within the study period, Nigeria has been producing below its potential. The implication is that the level of demand in the economy was deficient and there is the need to boost it. The ARDL model was also used to achieve this study objective due to the different integration orders of the study variables and its efficiency in providing reliable results when estimating with small samples. It was found that skills mismatch, oil price, lending rate, capital importation and capital formation coefficients were statistically significant while oil price, foreign exchange outflow coefficients were statistically insignificant in affecting output gap. The study found that, all things being equal, an increase in skills mismatch was associated with an increase in the output gap or a reduction in economic growth. Also, an increase in capital formation was found to be associated with a decrease in the output gap or an increase in economic growth. Oil price was found to be associated with an increase in economic growth or a reduction in the output gap. Lending rate and capital importation were also found to be associated with a decrease in output gap.

5.2 Conclusion

The first study objective sought to examine the effect of part-time employment on labor productivity in the agricultural, mining and quarrying, manufacturing, building and construction, transportation and storage, hotel and accommodation, finance and, trade sectors of the Nigerian economy. Part-time workers were found to positively contribute to labor productivity in the economy while total number of workers, capital importation and foreign exchange utilization were found to have negatively contributed to labor productivity in the economy. The

use of part-time workers in the production of goods and services is therefore beneficial to the Nigerian economy.

The second study objective sought to determine the effect of skills mismatch on unemployment. Skills mismatch contributed to the increase in unemployment. Number of youths and oil price also contributed to the rise in unemployment while real GDP growth was inversely related to unemployment and therefor contributed to its reduction in the economy. This implies that unemployment in the country had increased because labor does not possess the requisite skills due to skills mismatch.

The third study objective was to investigate the effects of skills mismatch on the output gap. The economy, within the study period was found to be producing below its potential which implies that demand is weak. Skills mismatch was found to increase the output gap and the coefficient was statistically significant. This meant that, demand in the economy was weakened as skills mismatch increased. Capital formation, oil price, lending rates and imported capital were also found to be statistically significant and contributed to a decrease in the output gap. This meant that demand was strengthened in the economy as a result of capital formation, oil price, lending rate and imported capital.

5.3 Policy implications

The study found that part-time workers contributed positively to labor productivity or output per worker. The government should encourage the employment of those that are unemployed as part-time workers and establish a section in the department of labor supervision in the federal ministry of labor 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 biannually 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 provide motivation for innovation, creativity and increased productivity. Long-term labor 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 labor productivity by contributing to technological advances and absorption of new technologies including the ones from abroad (Dieppe et al., 2020).

Capital importation at the level of the whole economy was found to reduce the output gap. The government should improve the investment climate in the country by interfacing with private security outfits, private sector producers and various bilateral and multilateral chambers of commerce to tackle the problem of insecurity in the country. This can be done through the setting up of a national investment and business security committee that will be meeting every six months to review the security situation in the country as it affects businesses. Also, there should be an investment and anti-corruption tribunal that will ensure judgment on investment and business-related cases within a period of not more than six months just as it is done with election petition tribunal cases. The nation's infrastructural facilities such as roads, railway lines, power and water supply should be improved upon. This will contribute to the establishment of more industries and will boost production through better utilization of resources which will eventually lead to a reduction in the output gap and improve on total workers contribution to labor productivity. It will also lead to reduction in

unemployment because of the increase in output because of the negative relationship that was found between real GDP growth and unemployment in the economy.

The utilization of foreign exchange was found to be statistically significant. The Central Bank of Nigeria should put in place incentives that will ensure a more robust use of foreign exchange by producers in the production process. It can do this by setting aside two percent of total foreign exchange utilized by a producer in the production of goods and services as refund to the producer. It can also set aside funds in the ITF for the upgrading of the skills of employees of firms who utilized foreign exchange for production. The parallel market for foreign exchange should be aligned with the official market. This can be done by making foreign currency available to users in banks. This will curb the artificial scarcity that provides incentive for round-tripping of foreign currencies.

The study findings show that skills mismatch contributes to the increase in unemployment and output gap in the economy. There should be a review of the nation's educational curriculum to meet up with the changing skills demand by producers. This can be done through a regular (bi-annual) review of the curriculum by a tripartite committee that should consist of National Universities Commission (NUC) and Ministry of Education Staff, Academic Staff Association Representatives and the Private Sector, to ensure that learning is practical, competence based and meets domestic, regional and global labor demand. There should also be an apprenticeship scheme that will be for all students in their second year of study in tertiary institutions. Similar committees should be established at the Local and State government levels and will meet regularly (bi-annually) to review changes in skills requirement by employers and

recommend same for teaching and learning in primary and secondary schools as part the national educational policy. Better skills enable firms adjust and adapt to market demand, competition, international trade, import competition and raise productivity in the economy. It also enhances a country's capacity to absorb FDI and enables additional employment of labor, workers are able to seize the best available employment opportunities and easily secure other jobs in the event of loss of employment (World Trade Oganization [WTO] and International Labour Office [ILO], 2017).

Empirical findings in the study showed that oil price contributes positively to the rise in unemployment in the economy. There is the need to make the economy less dependent on oil through the establishment of more industries especially SMEs, facilitate the growth and development of informal sector and the revitalization of the agricultural sector. A department of SMEs and informal sector should be established to ensure the growth and eventual transformation of informal to formal businesses and the growth of SMEs through the aggregation of their products for exports. This can be done in conjunction with the Nigeria Investment and Promotion Council (NIPC). Incentives should also be provided for Cooperative Societies that are into the production of goods and services. Designated funds can be set aside at single digit interest rate with conditions that are not stringent for such societies. That way the funds can be easily accessed and used for production of goods and services.

The number of youths was empirically found to be positively related with unemployment. The federal government, in partnership with the private sector can establish a youth entrepreneurship bank that will facilitate single digit interest rate loans and provide entrepreneurship skill development among the

youth. This will eventually boost youth employment in the economy. It can also set aside, exclusively, certain government business contracts and activities or even a quota of government transactions, for youths only. This can begin with the Ministry of Youths and Sports Development.

5.4 Areas for further research
Future studies can focus on skills mismatch effect on productivity in the economy. This will enable an analysis of how inadequate skills affects the output that is produced in the nation. Skills mismatch effects on wages will enable the nation do an assessment of how inadequate skills in the economy affects the ability of the worker to meet his/her socio-economic needs. The wage penalty of part-time employment on the worker in Nigeria can also be studied in future.

References

Abdullahi, A. (2015). Promoting Credible Elections in Developing Countries: International Development Partners and Civil Society Organizatios in Nigeria. *African Journal of Political Science and International Relations. Vol 9(5)*, 190-199.

Adamu, P., Iyoha, M., & Kouassi, E. (2009). *Estimating Potential Output for Nigeria: A Structural VAR Approach.* Retrieved from citeseer: www.citeseer.ist.psu

Adeniran, J., Yusuf, S., & Adeyemi, O. (2014). The Impact of Exchange Rate Fluctuation on the Nigerian Economic Growth: An Empirical Investigation. *International Journal of Academic Research in Business and Social Sciences.*, 224-233.

Adeola, O. Y., & Amr, A. S. (2020). Macroeconomic Determinants of Economic Growth in Africa. *International Review of Applied Economics*, 1-20.

Adnan, H., & Khan, S. U. (2008, April 6). *Munich Personal RePEc Achive.* Retrieved from Munich Personal RePEc Achive: www.mpra.ub.uni-muenchen.de

African Union, Economic Commission for Africa, African Development Bank and United Nations Development Programme. (2017). *2017 Africa Sustainable Development Report: Tracking Progress on Agenda 2063 and Sustainable Development Goals.* Addis-Ababa. Ethiopia.: ECA.

Agbloyor, K. E., Abor, Y. J., K.C, A. D., & Alfred, Y. (2014). Private Capital Flows and Economic Growth in Africa: The Role of Domestic Financial Markets. *Journal of International Financial Markets,Institutions and Money.*, 137-152.

Aghion, P., & Howitt, P. (2009). *The Economics of Growth.* Cambridge: MIT.

Ajose, K. (2018). Capital Formation and Economic Growth in Nigeria. *Accounting and Taxation Review, 2(2)*, 131-142.

Ajufo, B. I. (2013). Challenges of Youth Unemployment in Nigeria: Effective Career Guideance as a Panacea. *African Research Review*, 307-321.

Akinyele, S. (2010). A Critical Assessment of Environmental Impact on Workers Productivity in Nigeria. *Research Journal of Business Management, 4(1)*, 61-72.

Aktar, I., Demirci, N., & Ozturk, L. (n.d). Can Unemployment be Cured by Economic Growth and Foreign Direct Investment? *SU IIBF Sosyal ve Ekonomik Arastirmalar*, 453-467.

Ale, A. S., Akter, R., & Islam, S. M. (2018). Remittance Inflow and GDP Growth: Evidence from Bangladesh,India and Pakistan. *Asian Economic and Financial Review*, 1340-1353.

Ali, I., Ajibola, I., Omotosho, B., Adetoba, O., & Adeleke, O. (2015). Real Exchange Rate Misaligment and Economic Growth in Nigeria. *CBN Journal of Applied Statistics, 6(2)*, 103-131.

Alkhareif, R. M., Barnett, W. A., & Alsadoun, N. A. (2017). Estimating Output Gap for Saudi Arabia. *International Journal of Economics and Finance. 9(3).*, 81-90.

Alvarado, R., Iniguez, M., & Ponce, P. (2017). Foreign Direct Investment and Economic Growth in Latin America. *Economic Analysis Policy*.

Aminu, A. (2019). Characterising Graduate Uemployment in Nigeria as Education-Job Mismatch Problem. *African Journal of Economic Review, VII(2)*, 113-130.

Amor, M. B., & Hassine, M. B. (2017). The Relationship Between Unemployment and Economic Growth: Is Okun's Law Valid for the Saudi Arabia Case? *International Journal of Economics and Business Research. 14(1)*, 44-60.

Apap, W., & Gravin, D. (2014, August). Okun's Law in Malta: Lessons Learnt From Sectoral Perspective. *Economic Policy Department Working Paper Series*. Malta: Ministry of Finance Malta.

Asteriou, D., & Hall, S. G. (2011). *Applied Econometrics. Second Edition.* New York: Palgrave McMillan.

Baah-Boateng, W. (2016). The Youth Unemployment Challenge in Africa: What are the Drivers? *The Economic and Labor Relations Review*, 1-19.

Baily, N. M. (1981). The Productivity Growth Slowdown and Capital Accumulation. *The American Economic Review, 71(2)*, 326-331.

Ball, L. M., Leigh, D., & Loungani, P. (2013, January). Okun's Law: Fit at Fifty? *Okun's Law: Fit at Fifty?* Massachusetts, United States of America: NBER.

Bank Negara Malaysia. (2012). Potential Output and the Output Gap in Malaysia. *Quarterly Bulletin: Second Quarter*, 59-65.

Barro, R. J., & Sala-i-Martin, X. (2004). *Economic Growth.* London: MIT.

Bartlett, W. (2013). Skills Mismatch, Education Systems, and Labour Markets in EU Neighbourhood Policy countries. *Search Working Paper*.

Bas, M., & Strauss-Khan. (2014). Does Importing More Inputs Raise Exports? Firm-Level Evidence from France. *Review of World Economies. 150(2)*, 241-275.

Bennett, J., & McGuinness, S. (2009). Assessing The Impact Of Skill Shortages On The Productivity Performance Of High-Tech Firms In Northern Ireland. *Applied Economics, 41(6)*, 727-737.

Borowczyk-Martins. (2017). Why does Part-time Employment Increase in Recession? *IZA World of Labor*. Bonn, Germany: IZA.

Bruno, S. (1996). The Doubtful Blessing of Capital Imports: Reflections on the Fragility of Croatian Stabilization. *Communist Economies and Economic Transformation, 8(1)*, 67-78.

Burns, A. (2016). Potential Output in Asia: Some Forward-Looking Scenarios. *Asian Development Review, 33*, 28-55.

Cameron, C. A., & Trivedi, P. K. (2009). *Microeconometrics Using Stata.* Texas: Stata Press.

Caselli, F. (2006). Power Struggles and the Natural Resource Curse. *Working Paper*, 1-20.

Cental Bank of Nigeria. (2015). *Development Finance Department (DFD) Report.* Abuja: CBN.

Central Bank of Nigeria. (2018). *Economic Report for First Half of 2018.* Abuja: CBN.

Central Bank of Nigeria. (2018). *Central Bank of Nigeria*. Retrieved August 5, 2019, from A Central Bank of Nigeria website: www.cbn.gov,ng

Cerra, V., & Saxena, C. S. (2003). Alternative Methods of Estimating Potential Output and the Output Gap: An Application to Sweden. *Potential Output and Barriers to Growth.* Zalesie Gorne: NBP.

Chatterjee, S., & Hadi, A. s. (2006). *Regression Analysis by Example. 4th Edition.* New Jersey: John Wiley & Sons.

Chimere, O., Ihedinmma, I., & Omenihu, M. (2017). A Pooled Mean Group Estimation of Capital Inflow and Growth in Sub Saharan Africa. *Romanian Economic Journal*, 105-121.

Clemente, J., Montanes, A., & Reyes, M. (1998). Testing for a Unit Root in Variables with a Double Change in the Mean. *Economic Letters, 59.*, 175-182.

Da Silva, T. P. (2017, November). Research Paper. *Unemployment in Morocco: Explaining it by Skills Mismatch*. Rabat, Rabat, Morocco: OCP Policy Center.

Devicienti, F., Grinza, E., & Vannoni, D. (2018). The Impact of Part-Time Work on Firm Productivity: Evidence from Italy. *Industrial and Corporate Change*

Dimian, C. G., Begu, S. L., & Jablonsky, J. (2017). Unemployment and Labour Market Mismatch in the European Union Countries. *Zb.rad.fak.Rij. 35(1)*, 13-44.

Economic Commission for Africa. (2019). *Fiscal Policy for Financing Sustainable Development in Africa: Economic Report on Africa.* Addis Ababa: Economic Commission for Africa.

Economic Commission for Africa. (2020). *COVID-19 in Africa. Protecting Lives and Economies.* Addis Ababa: Economic Commission for Africa.

Economic Commission for Africa. (2020). *COVID-19 Lockdown. Exit Strategies for Africa.* Addis Ababa: Economic Commission for Africa.

Edokpolor, J. E. (2018). Influence of Self-Efficacy Antecedents on Career Decision-Making Among Business Education Students in Federal Universities in South Southern Nigeria. *Ibadan Journal of Education Studies*, 1-21.

Enste, D. H. (2018, November). *IZA World of Labor.* Retrieved from IZA : www.wol.iza.org

Estavao, M., & Tsounta, E. (2011, May). Has the Great Recession Raised US Structural Unemployment? *IMF Working Paper WP11(105)*. United States of America: International Monetary Fund.

Eugene, B. N., & Jonathan, M. (2016). Technology Gap,Imported Capital Goods and Productivity of Manufacturing Plants in Sub-Saharan Africa. *The Journal of International Trade and Economic Development*, 1-19

European Central Bank. (2012). *Euro Area Labour Markets and The Crisis.* Frankfurt: European Central Bank.

Fedderke, J. W., & Mengisteab, D. K. (2017). Estimating South Africa's Output Gap and Potential Growth Rate. *South African Journal of Economics*, 161-177.

Federal Ministry of Labour and Employment. (2017). National Employment Policy. *Federal Republic of Nigeria: National Employment Policy* . Abuja, Abuja: Federal Ministry of Labour and Employment.

Federal Republic of Nigeria. (2004). *Natiucation.* Yaba: National Educational Research and Development Council.

Federal Republic of Nigeria. (2014). *National Policy on Education.* Abuja: NERDC.

Filho, D. S. (2002, August). Estimating Brazillian Potential Output: A Production Function Approach. *Estimating Brazillian Potential Output: A Production Function Approach*. Banco Central do Brasil.

Fredrick, M. N., Nancy, H., & Kit, B. (2004). Human Capital Theory: Implications for Human Resource Development. *Human Resource Development International, 7(4)*, 545-551.

Garnero, A., Kampelmann, S., & Rycx, F. (2014). Part-Time Work,Wages and Productivity: Evidence from Belgian Matched Panel Data. *International Labour Review*.

Ghalayini, L. (2019). Estimating the Output Gap for Lebanon: A Production Function Methodology. *International Conference on Advances in Business and Management and Law.*, 60-83.

Giorno, C., Richardson, P., Roseveare, D., & van den Noord, P. (1995). Estimating Potential Output, Output Gaps and Structural Budget Balances. *OECD Economics Department Working Papers, No.152*. Paris, Paris, France: OECD.

Grossman, G. M., & Helpman, E. (1991). *Innovation and Growth in Global Economy.* Cambridge: MIT Press.

Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics. Fifth Edition.* New York: McGraw-Hill.

Halpern, L., Koren, M., & Szeidl, A. (2015). Imported Inputs and Productivity. *American Economic Review. 105(2)*, 3660-3703.

Hanusch, M. (2013). Jobless Growth? Okun's Law in East Asia. *Journal of International Commerce, Economics and Policy*, 1-14.

Haskel, J., & Martin, C. (1993). Do Skill Shortages Reduce Productivity? Theory And Evidence From The United Kingdom . *The Economic Journal, 103(417)*, 386-394.

Hornstein, A., & Krusell, P. (1996). Can Technology Improvements Cause Productivity Slowdowns? In B. Bernanke, & J. J. Rotemberg, *NBER Macroeconomics Annual, 11*, 209-276. Massacheusttes: MIT Press.

Houseman, S. N. (2001). Why Employers use Flexible Staffing Arrangements: Evidence from the Establishment Survey. *ILR Review*, 149-170.

Humal, K. (2013, May 31). *Lund University Libraries.* Retrieved September 25, 2019, from Lund University Web Site: http://lup.lub.lu.se/student-papers

Hurnik, J., & Navratil, D. (2005). Potential Output in the Czech Republic: A Production Function Approach. *Prague Economic Papers, 3*, 253-266.

Hutengs, O., & Stadmann, G. (2013). Age Effects in Okun's Law Within the Euro Zone. *Applied Econmics Letters, 20(9)*, 821-825.

Ierodiakonou, C., & Stavrou, E. (2015). Part-time Work, Productivity and Institutional Policies. *Journal of Organizational Effectiveness; People and Performance. 2(2)*, 176-200.

Ikpesu, F. (2019). Growth Effects of Capital Inflows and Investment in Nigeria. *International Journal of Management, Economics and Social Sciences.*, 5-19.

International Monetary Fund. (2019, April). *World Economic Outlook.* Retrieved from IMF: www.imf.org

International Monetary Fund. (2020, April). *World Economic Outlook.* Retrieved from IMF: www.imf.org

International Labour Organisation. (2013). *Global Employment Trends for Youth 2013: A Generation at Risk.* Geneva: ILO.

International Labour Organisation. (2015). *Non-Standard Forms of Employment.* Geneva: International Labour Organization.

International Labour Organisation. (2016). *Non-Standard Employment Around the World: Understanding Challenges, Shaping Prospects.* Geneva: International Labour Office.

International Labour Organisation. (2017). International conference on Jobs and Skills Mismatch. *International conference on Jobs and Skills Mismatch.* Geneva, Switzerland: ILO.

International Labour Organisation. (2020). *ILO Monitor: COVID-19 and the World of Work. Fifth Edition*. Retrieved from ILO: www.ilo.org

Jehly, G. A., & Reny, P. J. (2011). *Advanced Microeconomic Theory.* England: Pearson Education Limited.

Kallenberg, A. L., Reskin, B. F., & Hudson, K. (2000). Bad Jobs in America: Standard and Nonstandard Employment. *American Sociological Review. 65(2)*, 256-278.

Kara, H., Ogunc, F., Ozlale, U., & SariKaya, C. (2007). Estimating the Output Gap in a Changing Economy. *Southern Economic Journal, 74(1)*, 269-289.

Kasidi, F., & Mwakanemela, K. (2013). Impact of Inflation on Economic Growth: A Case Study of Tanzania. *Asian Journal of Empirical Research*, 363-380.

Kim, Y. E., & Loayza, N. V. (2019). Productivity Growth: Patterns and Determinants Across the World. *Economia. 42(84)*, 36-93.

Kinuthia, B., & Murshed, S. (2015). FDI Determinants: Kenya and Malaysia Compared. *Journal of Policy Modelling, 37(2)*, 388-400.

Lubik, T. (2009, January). *Estimating a Searching and Marching Model of the Aggregate Labor Market.* Retrieved November 4, 2019, from Researchgate: www.researchgate.net/publications

Lucifera, C., & Origo, F. (2002). *Semanticscholar.* Retrieved September 24, 2019, from A Semanticscholar Web site: www.semanticscholar.org

Mahy, B., Rycx, F., & Vermeylen, G. (2015). Education Mismatch and Firm Productivity: Do Skills, Technology and Uncertainty Matter? *IZA Discussion Papers, No. 8885, Institute of the Study of Labour*. Bonn, Bonn, Germany: IZA.

Manacorda, M., & Petrongolo, B. (1999). Skills Mismatch and Unemployment in OECD Countries. *Economica*, 181-207.

Mavromaras, K., McGuiness, S., & Fok, K. Y. (2009). Assessing The Incidence and Wage Effects of Overskilling in the Australian Labour Market. *The Economic Record, 85(268)*, 60-72.

McGowan, A. M., & Andrews, D. (2015). OECD Working Paper No. 1209. *Labour Market Mismatch and Labour Productivity: Evidence From PIAAC Data*. Paris, Paris, France: OECD.

McGowan, A. M., & Andrews, D. (2017). Labor Market Mismatch and Labor Productivity: Evidence from PIAAC Data. In *Skills Mismatch in Labor Markets* (pp. 199-241). Emerald .

McGuiness, S., Pouliakas, K., & Redmond, P. (2017). How Useful is the Concept of Skills Mismatch? *IZA Discussion Paper No 10786*. Bonn, Germany.

McGuiness, S., Pouliakas, K., & Redmond, P. (2018). Skills Mismatch: Concepts, Measurement and Policy Approaches. *Journal of Economic Surveys, 32(4)*, 985-1015.

Mesagan, E. P., Alimi, O. Y., & Yusuf, I. A. (2018). Macroeconomic Implications of Exchange Rate Depreciation: The Nigerian Experience. *Managing Global Transitions*, 235-258.

Meyer, D. F., & Sanusi, A. K. (2019). A Causality Analysis Of The Relationship Between Gross Fixed Capital Formation,Economic Growth and Employment in South Africa. *Studia Universitatais Babes-Bolyai Oeconomica.*, 33-44.

Micallef, B. (2016). Okun's Law and Structural Unemployment in Malta. In A. G. Gretch, *Understanding The Malta Economy.* (pp. 45-54). Malta: Central Bank of Malta.

Momodu, A. A., & Akani, F. N. (2016). Impact of Currency Devaluation on Economic Growth of Nigeria. *International Journal of Arts and Humanities. 5(16)*, 151-163.

Moroke, N., Leballo, P. G., & Mello, M. D. (2014). An Empirical Robustness of Okun's Law in South Africa: An Error Correction Modelling Approach. *Mediterranean Journal of Social Sciences. 5(23)*, 435-443.

Mowhei, M. (2018). The Impact of Foreign Capital Inflows on Economic Growth of Selected African Countries. *African Journal of Economic and Management*.

Muchai, D. N., & Muchai, J. (2016). Fiscal Policy and Capital Flight in Kenya. *African Development Review, 28(.S1)*, 8-21.

National Bureau of statistics. (2012). Nigeria Poverty Profile 2010. *Poverty Profile*. Abuja, Nigeria: National Bureau of Statistics.

National Bureau of Statistics. (2016). *Labour Productivity Report Q2 2016.* Abuja: Nigeria National Bureau of Statistics.

National Bureau of Statistics. (2018). *Labor Force Statistics, Volume 1: Unemployment and Underemployment Report (Q4 2017 - Q3 2018).* Abuja: National Bureau of Statistics.

National Bureau of Statistics. (2018). *National Bureau of Statistics* . Retrieved September 10, 2019, from National Bureau of Statistics Web site: www.nigeriastat.gov.ng

National Bureau of Statistics. (2019). *Nigerian Gross Domestic Product Report (Q2 2019).* Abuja: National Bureau of Statistics.

National Bureau of Statistics. (2020, May). Nigerian Gross Domestic Product Report Q1 2020. *Nigerian Gross Domestic Product Report Q1 2020.* Abuja, Abuja, Nigeria: NBS.

Nepal Rastra Bank. (2017). Potential Output and Output Gap Estimates for Nepal. *NRB Economic Review. 29(2)*, 1-14.

Ngbuelo, I. (2021). Implications of Strike on Socio-Economic Growth in Nigeria. *European Journal of Humanities and Educational Advancements. 2(7)*, 104-110.

Nielen, S., & Schiersch, A. (2016). Productivity in German Manufacturing Firms: Does Fixed Term Employment Matter? *International Labour Review.155(4)*, 535-561.

Nkoro, E., & Uko, A. K. (2016). Autoregrssive Distributed Lag(ARDL) Cointegration Technique: Application and Interpretation. *Journal of Statistical and Econometric Methods. 5(4)*, 63-91.

Nwankwo, C. F., & Okafor, P. U. (2018). Voting in Nigeria: Determinants of Turnout in the 2015 Presidential election. *Statistics,Politics and Policy*, 1-12.

Nzewi, H. N., & Ojiagu, N. C. (2014). Structural Youth Unemployment and Productivity in Sub-Saharan Africa: The Nigerian Manufacturing Sector Experience (2000-2013). *European Journal of Business Management. 6, (37)*, 310-315.

Oganisation for Economic Cooperation and Development. (2001). *Measuring Productivity OECD Manual Measurement of Aggregate and Industry Level Productivity Growth.* Retrieved November 14, 2019, from Measuring Productivity OECD Manual: www.oecd.org/sdd/productivity

Okafor, E. E. (2012). Nonstandard Employment Relations and Implications for Decent Work Deficits in Nigeria. *African Research Review. 6(6).*, 93-108.

Olatunde, J. O., & Jacob, D. O. (2019). Effect of Foreign Exchange Rate Volatility on Industrial Productivity in Nigreia, 1981-2015. *International Journal of Trend in Scientific Research and Development.*, 823-829.

Oleribe, O. O., Ezieme, P. I., Oladipo, O., Akinola, P. E., Udofia, D., & Taylor-Robinson, S. D. (2016). Industrial Action by Health Care Workers in Nigeria in 2013-2015: An Inquiry into Causes, Consequences and Control-A descriptive Study. *Human Resource Health*, 1-10.

Olitsky, N. H. (2008, August 27). *CiteSeer.* Retrieved September 24, 2019, from A CiteSeer Web site: www.citeseer.ist.psu.edu

Oluwatobi, A., Ayedun, C., Ajibola, O., Iroham, O., & Akinjere, O. (2017). Employers Perspective of the Employerbility Skill-Gap in Real Estate Education in Nigeria. *9th International Conference on Education and New Learning Technologies* (pp. 5851-5859). Barcelona: IATED.

Omojolaibi, J. (2013). Economic Growth, Unemployment and Poverty in Nigeria: A Macroeconometric Analysis. *Youth Unemployment and Poverty Reduction in Nigeria* (pp. 497-521). Ibadan: Nigeria Economic Society.

Onapajo, H., & Babalola, D. (2020). Nigeria's 2019 General Elections- A Shattered Hope? *The Round Table: The Commonwealth Journal of International Affairs*, 363-367.

Palmer, R. (2017). *Jobs and Skills Mismatch in the Informal Economy.* Geneva: ILO.

Pasara, T. M., & Garidzirai, R. (2020). Causality Effects among Gross Capital Formation, Unemployment and Economic Growth in South Africa. *Economies*, 1-12.

Phllips, P. C., & Xiao, Z. (1998). A Primer on Unit Root Testing. *Journal of Economic Surveys. 12(5)*, 423-470.

Pitambar, B. (2010). *Economic Review: Occasional Paper,2010.* Retrieved from Economic Review: Occasional Paper,2010: www.semanticscholar.org

Pitan, O. S., & Adedeji, S. (2012). Skills Mismatch Among University Graduates in the Nigeria Labor Market. *US-China Education Review*, 90-98.

Pitan, S. O. (2015). An Assessment of Generic Skills Demand in Five Sectors of the Nigerian Labour Market. *Public and Municipal Finance, 4(1)*, 28-36.

Prachowny, M. F. (1993). Okun's Law: Theoretical Foundations and Revised Estimates. *The Review of Economics and Statistics. 75(2).*, 331-336.

PwC. (2019, January). *22nd CEO Global Survey.* Retrieved from 22nd CEO Global Survey: www.pwc.com

Quitini, G. (2011). *Over Qualified or Under Skilled: A Review of Existing Literature.* Paris, France: Publications OECD. Retrieved from OECD.

Raheem, D. I., & Adeniyi, O. A. (2015). Capital Inflows and Outflows and Economic Growth in Sub-Saharan Africa. *International Journal of Economics and Business Research*, 66-80.

Reio, T. G. (2016). Nonexperimental Research: Strengths, Weaknesses and Issues of Precision. *European Journal of Training and Development. 40(8/9)*, 676-690.

Roeger, W. (2006). The Production Function Approach to Calculating Potential Growth and Output Gaps in EU Memeber States and the US. *Perspectives on Potential Output and Productivity.* France and Canada: Banque de France and Bank of Canada.

Romer, D. (1996). *Advanced Macroeconomics.* USA: MacGraw-Hill.

Rowthorn, R. (1995). Capital Formation and Unemployment. *Oxford Review of Economic Policy, 11(1)*, 26-39.

Samson, A. A. (2019). Macroeconomic Vs Resource Determinants of Economic Growth in Africa: A COMESA and ECOWAS Study. *International Economic Journal*, 1-26.

Samson, O. I., & Falola, H. (2014). Effects of Human Resource Waste on Productivity in Nigeria. *International Journal of Human Resource Management and Research. 4(3)*, 47-56.

Seetanah, B., & Rajid, S. (2011). Analysing the Sources of Economic Growth in Africa Using Growth Accounting and a Panel VAR Approach. *Journal of Developing Areas. 44(2)*, 367-390.

Sharma, R., Kautish, P., & Kumar, S. D. (2018). Impact of Selected Macroeconomic Determinants on Economic Growth in India: An Empirical Study. *Vision*, 1-11.

Skott, P., & Auerbach, P. (2003, July 7). *Research Gate.* Retrieved Spetember 24, 2019, from Research Gate Web site: www.researchgate.net/publication

Sparreboom, T., & Tavid, A. (2016). Imbalanced Job Polarization and Skills Mismatch in Europe. *J Labour Mkt Res 49*, 15-42.

Srinivasakumar, V., Renganathan, R., & Vijayabanu, C. (2015). Capital Formation and Inflation on Economic Growth in India. *Journal of Applied Sciences, Enginerring and Technology. 9(2).*, 1148-1152.

Staiger, D., Stock, J. H., & Watson, M. W. (1997). The NAIRU, Uemployment and Monetary Policy. *Journal of Economic Perspectives. 11(1)*, 33-49.

Statistics, N. B. (2017). *Corruption in Nigeria.* Abuja: NBS.

Stock, L., & Vogler-Ludwig, K. (2010, June 22). NAIRU and Okun's Law-The Macro-Economy in a Nutshell? *NAIRU and Okun's Law-The Macro-*

Economy in a Nutshell? Munich, Munich, Germany: European Commission.

Stundziene, A., & Saboniene, A. (2019). Tangible Investment and Labour Productivity: Evidence from European Manufacturing. *Economic Research-Ekonomiska Istrazivanja, 32(1)*, 3519-3537.

Sumon, k. K., & Miyan, S. M. (2017). Inflation and Economic Growth: An Empirical Evidence of Bangladesh(1986-2016). *International Journal of Economics and Financial Issues*, 454-464.

Tang, J., & Wang, W. (2005). Product Market Competition, Skill Shortages and Productivity: Evidence From Canadian Manufacturing Firms. *Journal of Productivity, 23*, 317-339.

Transparency International. (2017). *Corruption Perception Index 2016.* Berlin: Transparency International.

Transparency International. (2018). *Corruption Perception Index 2017.* Berlin: Transparency International.

Transparency International. (2019). *Corruption Perception Index 2018.* Berlin: Transparency International.

Transparency International. (2020). *Corruption Perception Index.* Berlin: Transparency International.

Tsai, Y. (2010). Returns to Overeducation: A longitudinal Analysis of the U.S Labor Market. *Economics of Education Review, 29*, 606-617.

Uma, K., Obidike, P., Eboh, F., & Ogbonna, B. (2013). The Dialectics of Industrial Disputes and Productivity in Nigeria's Economic Development. *Economics World.1(1)*, 29-38.

Ume, E. K., Okechukwu, O., Ralph, M. O., & Izuchukwu, O. (2016). Modelling the Long-run Relationship between Inflation and Economic Growth Using Engel and Granger Approach (Evidence from Nigeria 1985-2013). *IOSR journal of Humanities and Social Sciences*, 84-90.

United Nations Development Programme. (2015). *Human Development Report*. Retrieved February 28, 2017, from UNDP web site: www.hdr.undp.org

United Nations Economic Commssion for Africa. (2015). *High Level Panel on Illicit Financial Flows from Africa.* Addis Ababa: UNECA

United Nations Economic Commission for Africa. (2016). *Measuring Corruption in Africa: The International Dimension matters.* Addis Ababa: UNECA.

United Nations Economic Commission For Africa. (2017, March). *Country Profile 2016*. Retrieved March 20, 2018, from ECA Web site: www.eca.org

United Nations Economic Commission for Africa. (2018). *Natural Resource Governance and Domestic Revenue Mobilization for Structural Transformation.* Addis Ababa, Ethiopia: UNECA.

United Nations Economic Commission for Africa. (2020). *Innovative Finance for Private Sector Development in Africa.* Addis Ababa, Ethiopia.: UNECA.

Vermann, K. E. (2012, May). Page One Economics Newsletter. *Wait, Is Saving Good or Bad? The Paradox of Thrift*. St Louis, St Louis, USA: Federal Reserve Bank of St Louis.

Voda, A. D., Duguleana, L., & Dedrota, G. (2019). Investments,Economic Growth and Employment:VAR Method for Romania. *Studies in Business and Economics*, 231-244.

Wooldridge, J. M. (2009). *Introductory Econometrics.* Canada : South-Western Cengage Learning.

Wooldridge, J. M. (2016). *Introductory Econometrics: A Modern Approach, 6th Edition.* Boston, USA: Cengage Learning.

World Bank. (2016). *The World Bank*. Retrieved February 28, 2017, from World Bank Web site: http://www.data.worldbank.org

World Bank. (2019). *GDP Per Person Employed Constant 2011 PPP*. Retrieved December 16, 2019, from World Bank Web site: www.data.worldbank.org

World Bank. (2019, December 16). *World Bank: Data*. Retrieved from World Bank: data.worldbank.org

World Bank. (2020, July 24). *The World Bank: Data*. Retrieved from World Bank: data.worldbank.org

Yang, J.-H. (1979). Two Approaches to Narrowing the Output Gap. *Business Economics, Vol 14, No. 3*, 71-80.

Appendix I

Table A. 1: Panel Unit Roots Test

Variable	IPS		LLC	
	t-value	P-value	t-value	P-value
Labor productivity	-0.2823	0.3889	-8.7290***	0.0000
Capital imported	-4.6945***	0.0000	-1.6646**	0.0480
Number of workers	-1.3185*	0.0937	-12.7702***	0.0000
Foreign exchange utilization	-2.5993***	0.0047	-2.7875***	0.0027
Proportion of part-time workers	-2.5160***	0.0059	-8.1166***	0.0000

Note:***,**,* denote level of significance at 1 percent, 5 percent and 10 percent respectively. The IPS null hypothesis is that all panels contain unit roots while the alternative hypothesis is that some panels are stationary. The LLC null hypothesis is that panels contain unit roots while the alternative hypothesis is that panels are stationary.

Source: Author's computation from study data.

Table A. 2: Variance Inflation Factor

variable	VIF	1/VIF
Number of workers	1.58	0.632610
Proportion of part-time workers	1.47	0.680759
Exchange rate utilization	1.28	0.780944
Capital importation	1.26	0.792015
2015 election	1.02	0.994962
Mean VIF	1.32	

Table A. 3: Pairwise correlation coefficient result

Variable	Election	Capital importation	Total number of workers	Proportion of part-time workers	Foreign exchange utilization
Election	1.0000				
Capital importation	-0.0162	1.0000			
Total number of workers	0.0617	0.1622	1.0000		
Proportion of part-time workers	-0.0255	0.2440	-0.4544	1.0000	
Foreign exchange utilization	0.0322	0.3399	0.3559	0.0150	1.0000

Table A. 4: Breusch and Pagan Lagrangian Multiplier Test for Random Effects

Variable	Var	Sd = Sqrt (Var)
Labor productivity	3.349467	1.830155
E	0.0248868	0.1577554
U	0.9249733	0.9617553
Chibar2(01)	642.58	
Prob>Chibar2	0.0000	

Note: The null hypothesis is that the variance across entities is zero while the alternative hypothesis is that, there are variations across entities.

Table A. 5: Hausmann Specification Test Result

Variable	(b)FE	(B)RE	(b-B) Differnce	Sqrt(diagV_b-V_B))
Election	0.0048725	0.0039094	.0009631	0.0018965
Capital importation	-0.020019	-0.018777	-0.0012415	-
Total number of workers	-0.877186	-0.943633	0.664476	0.0771407
Proportion of part-time workers	0.3821128	0.4782444	-0.0961316	0.0778394
Foreign exchange utilization	-0.020843	0.0218613	0.0010182	0.0017535
Chi2(6)	3.42			
Prob>Chi2	0.6355			

Appendix II
Table B. 1: CMR Stationarity Test Result

Variable	Additive Outliers (AO)		Innovational Outliers (IO)	
	t-statistic	Optimal breaks	t-statistic	Optimal breaks
Skills Mismatch	-5.640*	2013q2,2016q1	-0.774	2010q4,2013q1
Oil price	-4.687	2015q2,2016q1	-5.273	2014q2,2017q3
Youth	-0.811	2012q1,2013q4	-4.059	2011q2,2013q3
Labor force	-2.612	2013q3,2016q2	-2.867	2015q1,2016q4
Gross fixed capital formation	-4.946	2013q3,2015q4	-5.702*	2013q3,2016q1
Real GDP growth	-3.459	2015q3,2017q3	-4.134	2012q4,2014q3
Changes in capital inventory	-3.666	2011q2,2016q3	-4.713	2011q3,2016q2
Capital importation	-4.881	2012q2,2015q2	-3.197	2012q1,2015q2
Foreign exchange inflow	-4.272	2015q1,2017q1	-4.009	2015q3,2017q1
Foreign exchange outflow	-3.214	2013q3,2015q3	-3.057	2012q4,2015q3
Capital formation	-5.049	2013q3,2015q4	-5.542*	2013q3,2016q1
Output gap	-1.271	2015q2,2016q3	-2.963	2015q1,2016q4
Lending rate	-3.094	2013q1,2017q1	-3.250	2012q2,2016q2
Inflation rate	-3.602	2013q1,2015q4	-7.701*	2012q3,2015q3
First difference stationarity test result				
Youth	-3.248	2012q3,2013q2	-6.071*	2012q3,2013q3
Labor force	-2.528	2014q4,2015q3	-8.368*	2015q1,2016q3
Oil price	-2.640	2014q3,2015q3	-8.317*	2014q2,2015q4
Real GDP growth	-7.498*	2014q2,2016q3	-7.313*	2014q3,2016q3
Changes in capital inventory	-11.953*	2013q4,2015q3	-5.574*	2012q1,2015q4
Capital importation	-5.450	2013q1,2016q3	-6.186*	2013q1,2015q4
Foreign exchange inflow	-8.014*	2011q3,2015q4	-9.898*	2011q3,2015q4
Foreign exchange outflow	-7.806*	2014q3,2017q1	-9.179*	2014q4,2016q4
Output gap	-7.361*	2013q4,2015q3	-7.544*	2014q1,2015q4
Lending rate	-1.193	2012q2,2016q3	-5.738*	2012q3,2016q2

*Significant at 5%

Note: The null hypothesis is that the series has a unit root with structural breaks while the alternative hypothesis is that the series is stationary with breaks.

Source: Author's computation from study data

Table B. 2: Variance Inflation Factor

Variable	VIF	1/VIF
Labor force	6.77	0.147795
Real GDP	5.43	0.184117
Gross fixed capital	4.43	0.225742
Oil price	4.34	0.230342
Youth	2.56	0.390284
Skills mismatch	1.74	0.575773
Mean VIF	4.21	

Table B. 3: Pairwise Correlation Test

	Youth	Real GDP	Skills mismatch	Labor force	Gross fixed capital	Oil price
Youth	1.0000					
Real GDP	- 0.6249	1.0000				
Skills mismatch	0.4818	-0.4269	1.0000			
Labor force	0.7304	-0.6718	0.6076	1.0000		
Gross fixed capital	- 0.6308	0.7240	-0.3894	0.8085	1.0000	
Oil price	- 0.4837	0.8156	-0.4096	-0.6875	0.5675	1.0000

Table B. 4: Bounds cointegration test

F statistic = 5.106   t statistic = -3.295

	I_0	I_1	I_0	I_1	I_0	I_1	I_0	I_1
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
F	2.03	3.13	2.32	3.50	2.60	3.84	2.96	4.26
T	-2.57	-4.23	-2.86	-4.57	-3.13	-4.85	-3.43	-5.19

Table B. 5: Autocorrelation, White and Ramsey Test Results

Autocorrelation test	
Durbin-Watson statistic	2.294658
Breusch-Godfrey LM	
Lags(P)	1
Chi2	0.1365
df	1
Prob Chi>2	0.3855
White's test	
Chi2	29
Prob>Chi2	0.4140
Ramsey test	
F(3,21)	0.99
Prob>F	0.4178

Note: The null hypothesis of the Durbin-Watson test is that, there is no autocorrelation while the alternative hypothesis is that, there is autocorrelation.

The null hypothesis of the Breusch-Godfrey LM test is, there is no serial correlation while the alternative hypothesis is that there is the presence of autocorrelation.

The White's test null hypothesis is that, the variance is equally spread (homoscedasticity) while the alternative hypothesis is that the variance has an unrestricted spread (heteroscedasticity).
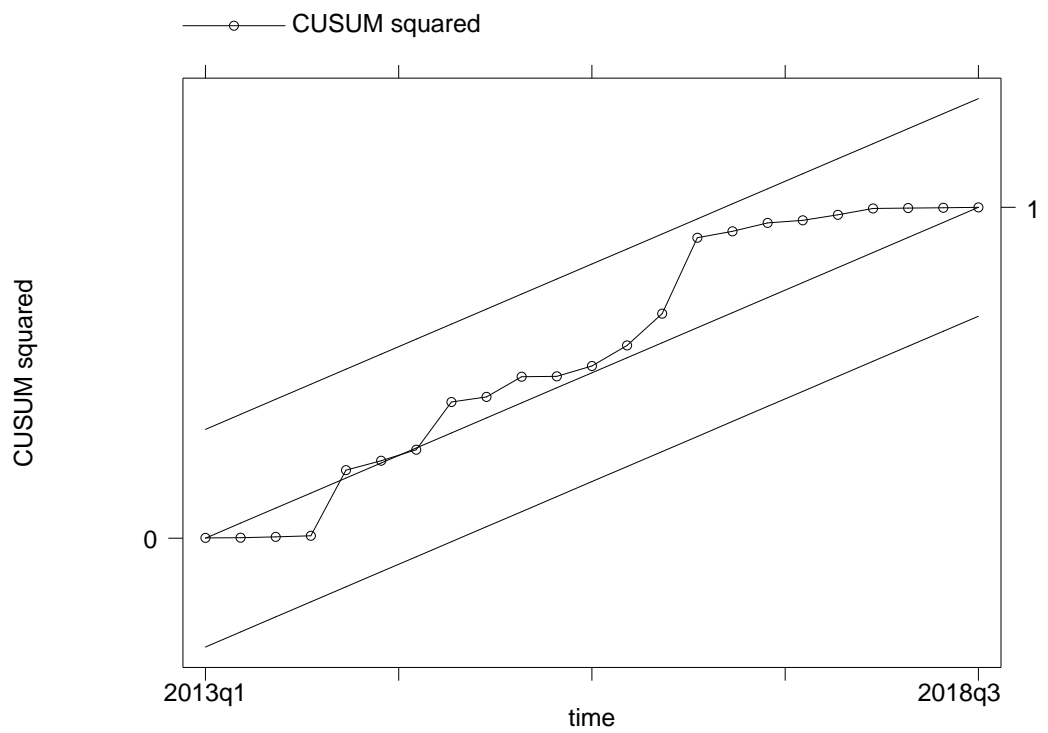
Figure B. 1: Model Stability Test

Appendix III

Table C. 1: Variance Inflation Factor

Variable	VIF	1/VIF
Lending rate	7.14	0.140146
Capital formation	5.78	0.173044
Oil price	5.20	0.192183
Inflation rate	3.63	0.275188
Capital importation	3.37	0.297032
Foreign exchange inflow	1.66	0.601624
Foreign exchange outflow	1.37	0.732032
Skills mismatch index	1.32	0.758413
Mean VIF	3.68	

Table C. 2: Pairwise Correlation

Variables	SMI	Forex inflow	Forex outflow	Oil price	Capital formation	Capital importation	Lending rate	Inflation rate
SMI	1.0000							
Forex inflow	-0.2061	1.0000						
Forex outflow	-0.0050	0.2079	1.0000					
Oil price	-0.3851	0.4572	0.3795	1.0000				
Capital formation	-0.2768	0.1436	0.1449	0.5572	1.0000			
Capital importation	-0.0443	0.4985	0.4127	0.5130	0.1047	1.0000		
Lending rate	-0.4070	0.0038	-0.0540	-0.6142	-0.7786	0.1521	1.0000	
Inflation rate	0.2032	-0.3957	-0.3714	-0.5381	-0.6985	-0.5059	0.3556	1.0000

Table C. 3: Bounds Cointegration Test

F statistic = 11.351   t statistic = - 8.036

	I_0	I_1	I_0	I_1	I_0	I_1	I_0	I_1
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
F	2.03	3.13	2.32	3.50	2.60	3.84	2.96	4.26
T	-2.57	-4.23	-2.86	-4.57	-3.13	-4.85	-3.43	-5.19

Table C. 4: Autocorrelation Test

Autocorrelation test	
Durbin-Watson statistic	2.02915
Breusch-Godfrey LM	
Lags(P)	1
Chi2	0.239
df	1
Prob Chi>2	0.6246
White's test	
Chi2	33
Prob>Chi2	0.4180
Ramsey test	
F(3,23)	0.25
Prob>F	0.8629

Note: The null hypothesis of the Durbin-Watson test is that, there is no autocorrelation while the alternative hypothesis is that, there is autocorrelation.

The null hypothesis of the Breusch-Godfrey LM test is, there is no serial correlation while the alternative hypothesis is that there is the presence of autocorrelation
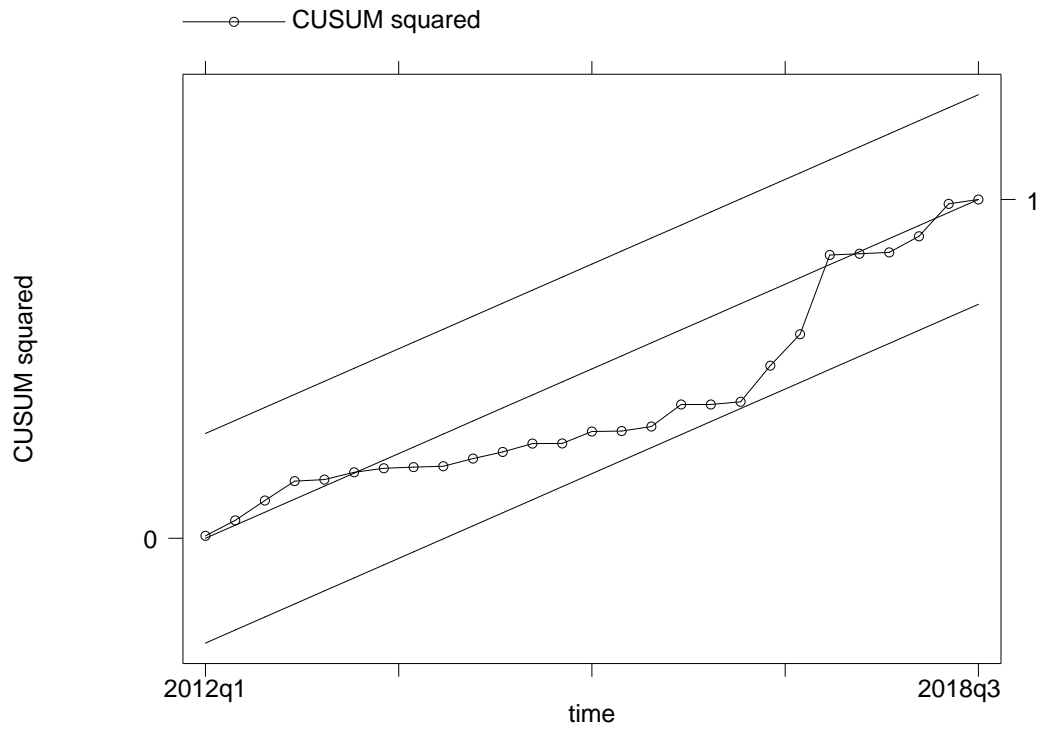
Figure C. 1: Model Stability Test

Table D.1: Data

Year	Skills Mismatch Index	Unemployment Rate	Labor Force	Number of Youth	Oil Price	Real GDP Growth Rate	Gross Fixed Capital Formation
2010 Q1	0.729	5.6	64337005.00	29376108.00	77.61		147058961.57
2010 Q2	0.722	5.1	64902578.00	27564238.00	79.67		134517233.22
2010 Q3	0.712	4.9	65453416.00	26429218.00	78.5		170464969.77
2010 Q4	0.702	4.9	65989517.00	25971049.00	88.09		158848293.71
2011 Q1	0.571	5.1	66510882.00	26189730.00	106.84	6.88	142691752.49
2011 Q2	0.684	5.5	67017511.00	27085262.00	121.09	6.37	123781089.25
2011 Q3	0.679	6.2	67509405.00	28657644.00	115.91	3.61	146008639.08
2011 Q4	0.677	7.1	67986562.00	30906876.00	112.67	4.69	134251339.92
2012 Q1	0.668	9.7	68388653.00	38289246.00	121.25	3.46	140653694.78
2012 Q2	0.667	10.5	68860470.00	40109665.00	110.69	4.11	143375924.91
2012 Q3	0.668	11	69341684.00	40824419.00	110.94	5.57	126281909.30
2012 Q4	0.671	11.2	69832294.00	40433510.00	111.84	3.64	138417747.69
2013 Q1	0.677	11	70332300.00	38936937.00	114.91	4.45	134151729.69
2013 Q2	0.686	10.6	70841703.00	36334699.00	105.69	5.40	157463364.05
2013 Q3	0.697	9.8	71360501.00	32626797.00	112.64	5.17	142954668.47
2013 Q4	0.714	8.6	71888696.00	27813231.00	112.33	6.77	157941632.40
2014 Q1	0.685	8	71641171.00	34183367.00	110	6.21	161095366.83
2014 Q2	0.691	7	72037645.00	34372543.00	112	6.54	178366804.04
2014 Q3	0.692	10	72545834.00	34615024.00	103	6.23	154944756.17
2014 Q4	0.683	6	72931608.00	34799095.00	78	5.94	169860547.55
2015Q1	0.690	8	73436104.00	35039814.00	55	3.96	144455139.90
2015 Q2	0.692	8	74010602.00	35313934.00	63	2.35	141556769.41
2015 Q3	0.693	10	75940402.00	36380320.00	51	2.84	118272987.88

2015 Q4	0.693	10	76957923.00	36720239.00	44	2.11	131294377.74
2016 Q1	0.696	12	78486570.00	38249628.00	34	-0.36	128447441.40
2016 Q2	0.702	13	79886310.00	39569148.00	46	-2.06	127328568.92
2016 Q3	0.704	14	80669196.00	40155660.00	46	-2.24	69119931.25
2016 Q4	0.702	14	81151885.00	40739520.00	50	-1.30	78045239.59
2017 Q1	0.695	14	82592121.00	40992737.00	54	-0.91	80269673.03
2017 Q2	0.705	16	83940088.00	41779450.00	50	0.72	83548565.95
2017 Q3	0.705	19	85088055.00	43015540.00	52	1.17	69640476.35
2017 Q4	0.716	20	86537538.00	42630875.00	62	2.11	81536020.06
2018 Q1	0.712	22	88206724.00	43412870.00	68	1.50	80417496.91
2018 Q2	0.705	23	89509201.00	44163821.00	75	1.81	89672743.88
2018 Q3	0.709	23	90470592.00	44229419.00	76	2.88	83916955.41

Year	Capital Formation	Output Gap	Capital Importation	Foreign Exchange Inflow	Foreign Exchange Outflow
2010 Q1	153916169.3	-7.91467	1,760,080,000	8,083,000,000	9,014,900,000
2010 Q2	141262174.2	-7.93025	1339800000	5840700000	6396300000
2010 Q3	176993223.6	-7.95953	1500230000	7557000000	11424100000
2010 Q4	165864158	-7.92381	1395590000	7310000000	9468900000
2011 Q1	149330110.4	-7.91648	1806930000	10719400000	9560400000
2011 Q2	130250189	-7.9218	2565870000	8854900000	10970600000
2011 Q3	152550217.1	-7.95593	1611750000	14327700000	14148800000
2011 Q4	140951290.2	-7.93652	1919220000	13603600000	13395700000
2012 Q1	148180899.9	-7.87552	3615950000	12119800000	9760500000
2012 Q2	151641966.2	-7.84432	2831740000	10050900000	9594900000
2012 Q3	133572461.3	-7.91883	4365280000	14462300000	8629200000
2012 Q4	146319628.7	-7.90756	5877550000	11168380000	7817120000
2013 Q1	142125826	-7.87477	6600570000	10304460000	6313040000
2013 Q2	166204687	-7.84109	7849070000	9442910000	12542530000
2013 Q3	150716380.6	-7.91762	4441610000	11857350000	12667330000
2013 Q4	166640558.5	-7.88367	4697540000	9465520000	10789610000
2014 Q1	169299853.8	-7.87819	3932010000	10221430000	15695660000
2014 Q2	187662661	-7.8345	5821320000	12667310000	12806250000
2014 Q3	163223020.2	-7.91251	6547860000	13094230000	11804980000
2014 Q4	178559330.7	-7.87418	4499740000	10359390000	14211630000
2015Q1	150732889.6	-7.94617	2746920000	8307230000	12875770000
2015 Q2	148570554.6	-7.88452	2733610000	6976020000	8194560000
2015 Q3	124584039.1	-7.96911	2748100000	11111000000	9523320000

2015 Q4	138187779.3	-7.93623	1556950000	7135410000	7757490000
2016 Q1	134022638.9	-8.02124	710970000	3942890000	4487050000
2016 Q2	133029512	-7.97824	1100870000	5875180000	6023100000
2016 Q3	73197343.13	-7.98739	1822120000	5613010000	7912020000
2016 Q4	82870964	-7.92444	1712980000	6637940000	4649850000
2017 Q1	84942478.97	-7.92512	908270000	6597730000	3646890000
2017 Q2	88974354.03	-7.87234	1913990000	9355290000	9048620000
2017 Q3	74474206.67	-7.92959	4199150000	11984050000	9343060000
2017 Q4	86744767.95	-7.89279	5383010000	14708450000	8444270000
2018 Q1	86052064.2	-7.84945	6303860000	14159090000	9652660000
2018 Q2	95523278.19	-7.82887	5595120000	13822780000	13290530000
2018 Q3	88556398.26	-7.93086	2855050000	12949010000	16931360000

Table D.1: Continued

Period	Sector	Election	Capital Importation	Total Number of Workers	Proportion of Part-time workers	Exchange Rate Utilization	Labor Productivity
2012q3	agriculture	0	7300000	48398	0.230443	65940000	3572.768
2012q4	agriculture	0	25020000	49276	0.234049	28060000	3884.353
2013q1	agriculture	0	22179286	50544	0.232827	21090000	5250.069
2013q2	agriculture	0	30790000	51162	0.231383	133590000	4656.864
2013q3	agriculture	0	40100000	54434	0.254124	89690000	3200.748
2013q4	agriculture	0	24850000	55024	0.255416	53390000	3481.05
2014q1	agriculture	0	15529965	55447	0.258589	132160000	4837.077
2014q2	agriculture	0	320000	56447	0.26338	110290000	4191.134
2014q3	agriculture	0	830000	61067	0.296167	141780000	2910.205
2014q4	agriculture	0	8190000	69901	0.348221	129400000	2873.095
2015q1	agriculture	1	4680000	72941	0.356713	36840000	3753.955
2015q2	agriculture	1	2930000	80591	0.411287	97640000	3199.379
2015q3	agriculture	1	95105000	85000	0.436341	40290000	2150.143
2015q4	agriculture	1	500000	87524	0.444701	76810000	2354.219
2016q1	agriculture	0	3199920	88655	0.448954	49880000	3195.184
2016q2	agriculture	0	1999920	96887	0.491294	57440000	2741.668
2016q3	agriculture	0	12899992	105491	0.526007	52170000	1828.383
2012q3	mining and quarry	0	123201063	7296	0.616776	54020000	17831.07
2012q4	mining and quarry	0	18031167	7512	0.620873	47400000	17679.18
2013q1	mining and quarry	0	9759229	7704	0.614875	44740000	18125.52
2013q2	mining and quarry	0	141166475	7836	0.604518	119870000	20410.94
2013q3	mining and quarry	0	7303494	7975	0.595486	106960000	19947.6
2013q4	mining and quarry	0	53708971	8044	0.593983	119930000	17771.65
2014q1	mining and quarry	0	201145420	8072	0.591923	131710000	16382.7

2014q2	mining and quarry	0	4839041	8131	0.590702	48480000	15713.25
2014q3	mining and quarry	0	42399148	8155	0.589822	91050000	17282.41
2014q4	mining and quarry	0	1050877	8247	0.585668	77420000	15299.82
2015q1	mining and quarry	1	11504634	8377	0.581951	115440000	16985.93
2015q2	mining and quarry	1	5805212	8694	0.588567	157280000	13126.85
2015q3	mining and quarry	1	2332538	8770	0.588255	96680000	14323
2015q4	mining and quarry	1	13391242	8841	0.58602	69410000	11972.34
2016q1	mining and quarry	0	20827714	8961	0.580404	28670000	13582.42
2016q2	mining and quarry	0	200802541	8955	0.578783	14490000	11590.28
2016q3	mining and quarry	0	171678540	9011	0.577849	45110000	13049.2
2012q3	manufacturing	0	97715323	349912	0.080612	1041380000	163.9427
2012q4	manufacturing	0	231994437	358150	0.082041	1152720000	162.8198
2013q1	manufacturing	0	186585830	369231	0.085505	1108660000	158.2232
2013q2	manufacturing	0	352798978	378231	0.084171	995710000	156.9455
2013q3	manufacturing	0	80502321	392178	0.086547	1044530000	155.759
2013q4	manufacturing	0	38864303	404513	0.086598	1059570000	153.5483
2014q1	manufacturing	0	104073482	406157	0.089364	1414360000	165.4887
2014q2	manufacturing	0	107877988	409357	0.093815	1368950000	171.0842
2014q3	manufacturing	0	365102712	463804	0.099999	1293490000	154.3773
2014q4	manufacturing	0	366923933	495205	0.122761	1356810000	151.3205
2015q1	manufacturing	1	124287465	514852	0.123348	1278310000	144.3245
2015q2	manufacturing	1	54261652	522633	0.125407	1067560000	151.5458
2015q3	manufacturing	1	171475403	525741	0.126112	853750000	143.8529
2015q4	manufacturing	1	917187341	527622	0.126075	773840000	172.1102
2016q1	manufacturing	0	89407566	529116	0.125904	753620000	172.2574
2016q2	manufacturing	0	119428184	530429	0.125717	790860000	177.6102
2016q3	manufacturing	0	73875804	533412	0.1254	886680000	176.6537

2012q3	building and construction	0	6980000	20461	0.03861	46540000	1307.277
2012q4	building and construction	0	16360000	21895	0.039141	30000000	1182.126
2013q1	building and construction	0	19060000	24236	0.038703	260000	1010.559
2013q2	building and construction	0	4450000	26423	0.035499	11830000	1037.112
2013q3	building and construction	0	22640000	29188	0.032136	34330000	951.8915
2013q4	building and construction	0	9030000	29778	0.034321	41150000	863.9312
2014q1	building and construction	0	10630000	31271	0.034217	25550000	850.9013
2014q2	building and construction	0	4620000	34189	0.032028	19620000	1102.564
2014q3	building and construction	0	4880000	35157	0.03163	22970000	836.0557
2014q4	building and construction	0	35560000	36248	0.035974	1970000	971.8098
2015q1	building and construction	1	4550000	37137	0.036864	37470000	783.6436
2015q2	building and construction	1	3410000	37903	0.041263	11780000	860.8586
2015q3	building and construction	1	11100000	38200	0.041414	1560000	885.5925
2015q4	building and construction	1	9380000	38516	0.041074	610000	1037.139
2016q1	building and construction	0	10160000	38793	0.041193	20000	853.6884
2016q2	building and construction	0	14950000	40080	0.039047	240000	937.2755
2016q3	building and construction	0	3620000	41405	0.03787	10000	963.1291
2012q3	Trade	0	266592289	142077	0.067154	12240000	1027.831
2012q4	Trade	0	129587354	144280	0.069289	27330000	1031.518
2013q1	Trade	0	18299081	148706	0.06954	7990000	995.1657
2013q2	Trade	0	19954539	154996	0.074266	10200000	1002.97
2013q3	Trade	0	87995764	159186	0.076156	20280000	963.4699
2013q4	Trade	0	157319455	162587	0.077872	34010000	952.5385

2014q1	Trade	0	177353739	161544	0.079378	29640000	962.3998
2014q2	Trade	0	68107871	156702	0.079571	20100000	1031.485
2014q3	Trade	0	46426865	171987	0.078116	17210000	873.5893
2014q4	Trade	0	101716925	182646	0.084223	47160000	845.4411
2015q1	Trade	1	34881724	197852	0.081879	12890000	788.1012
2015q2	Trade	1	92288594	201959	0.081635	16390000	818.0036
2015q3	Trade	1	6655864	203477	0.081646	3090000	787.3943
2015q4	Trade	1	40769676	204457	0.081489	7620000	797.7083
2016q1	Trade	0	55076768	205047	0.081411	9730000	811.8478
2016q2	Trade	0	12372855	205747	0.081464	2200000	866.235
2016q3	Trade	0	18951158	207387	0.081346	1460000	821.0768
2012q3	accomodation and food	0	305000	89458	0.026113	39520000	47.03176
2012q4	accomodation and food	0	20000000	92483	0.028632	7170000	38.10731
2013q1	accomodation and food	0	20000000	96329	0.030936	13530000	45.25778
2013q2	accomodation and food	0	92550	100447	0.034018	2810000	42.39562
2013q3	accomodation and food	0	77609.94	104218	0.033958	2250000	40.60631
2013q4	accomodation and food	0	108197.75	105878	0.034436	1110000	32.54857
2014q1	accomodation and food	0	573615.07	106908	0.035376	14900000	42.88093
2014q2	accomodation and food	0	531839.03	102221	0.033271	6470000	50.2952
2014q3	accomodation and food	0	1336493.73	110267	0.04013	136030000	44.11973
2014q4	accomodation and food	0	8825861.07	120429	0.043005	135400000	30.92439
2015q1	accomodation and food	1	453000	132458	0.047509	86560000	39.64828
2015q2	accomodation and food	1	1000	137152	0.047801	45130000	43.06888
2015q3	accomodation and food	1	1149470.08	138342	0.047715	27040000	58.25117
2015q4	accomodation and food	1	10000	138830	0.04772	9600000	46.5301

2016q1	accomodation and food	0	750000	139698	0.047567	4310000	65.46176
2016q2	accomodation and food	0	1000	140334	0.048021	4880000	76.28499
2016q3	accomodation and food	0	1000	148391	0.048817	2910000	66.9444
2012q3	transportation	0	7964070	80672	0.021705	435270000	119.6538
2012q4	transportation	0	1000	82622	0.024739	293300000	142.3077
2013q1	transportation	0	1000	85031	0.026061	213610000	138.6177
2013q2	transportation	0	1000	85872	0.02647	333240000	151.6707
2013q3	transportation	0	126800	87170	0.02642	391540000	115.502
2013q4	transportation	0	548487.07	87633	0.02628	400370000	134.8852
2014q1	transportation	0	304370	87281	0.026569	330700000	143.2645
2014q2	transportation	0	1635100.01	87564	0.027443	391530000	152.2556
2014q3	transportation	0	1000	87988	0.027629	464060000	107.2774
2014q4	transportation	0	528300	88587	0.027792	353520000	127.1605
2015q1	transportation	1	2098333	89349	0.027879	176000000	131.6495
2015q2	transportation	1	229930	89618	0.027796	275770000	141.6883
2015q3	transportation	1	6108252	89768	0.027359	288210000	110.2238
2015q4	transportation	1	1546312	89989	0.027559	216010000	129.7104
2016q1	transportation	0	860000	90236	0.027483	142450000	135.0501
2016q2	transportation	0	1000	90005	0.027187	99510000	146.2972
2016q3	transportation	0	1548974	89511	0.026946	31400000	113.7847
2012q3	Finance	0	695312403	108345	0.043306	2122070000	300.8607
2012q4	Finance	0	376564695	132519	0.042545	2972870000	241.7839
2013q1	Finance	0	553137845	171760	0.037564	3039030000	174.9783
2013q2	Finance	0	1016678161	177681	0.041113	7761940000	181.8556
2013q3	Finance	0	416641401	181116	0.043282	5717140000	124.0658
2013q4	Finance	0	952598891	182823	0.044064	5699640000	130.7317
2014q1	Finance	0	467403694	184684	0.042126	7900860000	116.0606
2014q2	Finance	0	914243858	185478	0.044674	5309480000	122.2212
2014q3	Finance	0	1404818554	189332	0.045338	5151440000	146.627
2014q4	Finance	0	903217378	194004	0.045571	6772630000	145.6264
2015q1	Finance	1	878380876	197792	0.046594	4607700000	126.0208
2015q2	Finance	1	465067221	199422	0.047247	3649850000	131.6285
2015q3	Finance	1	279392866	200783	0.047688	3983690000	150.5773
2015q4	Finance	1	207198902	201634	0.048231	2534940000	152.5179
2016q1	Finance	0	150148367	202762	0.04815	1577470000	134.546
2016q2	Finance	0	114851485	204839	0.048931	1686940000	138.1635
2016q3	Finance	0	36560329	203849	0.049404	1753570000	161.4723