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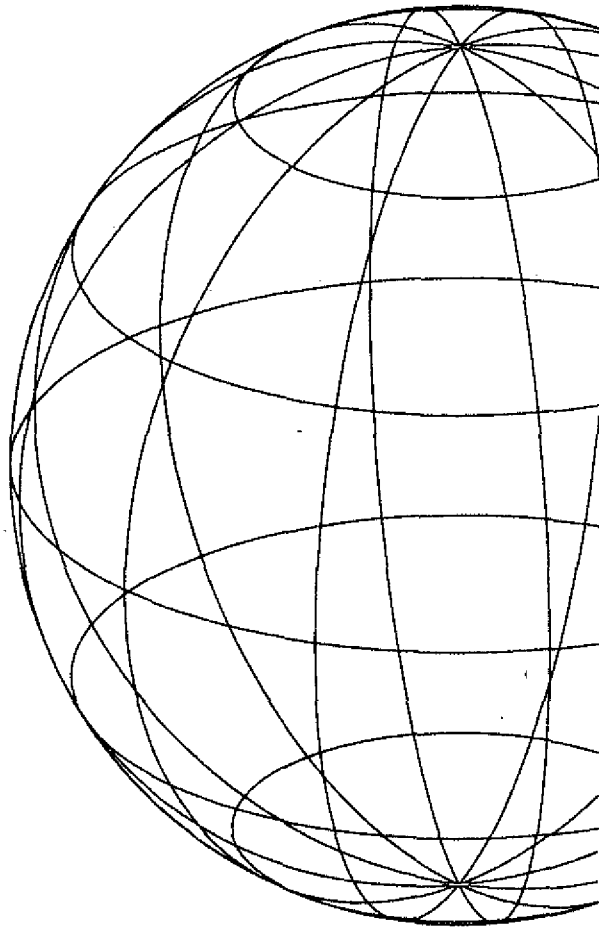
UNIDO RESEARCH PROGRAMME

Productivity Performance in Developing Countries

Country Case Studies

Nigeria



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INDUSTRIAL DEVELOPMENT ORGANIZATION

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Nigeria

Adeola F. Adenikinju

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2005

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Executive summary

Background and Context

This report provides an analysis of productivity growth in Nigeria. The report addresses three key objectives. The first is the analysis of productivity trends in Nigeria between 1962 and 2000. The second is the identification and assessment of the key determinants of productivity performance in Nigeria over the study period. The third is the description, discussion and analysis of the policies adopted by Nigeria that have direct and potential explicit or implicit impact on productivity growth.

A study on productivity growth in Nigeria is important for a number of reasons. First, there is a direct linkage between productivity growth and sustained economic growth. Secondly, Nigeria's development experience shows that past growth strategy based on factor accumulation is both infeasible and sub-optimal. The economic reality facing the country today requires a shift in emphasis to factor efficiency. Finally, higher productivity is also a key to poverty reduction.

Trends in Productivity

A key finding of this study is that Nigeria's economic growth over the study period was driven primarily by factor accumulation. Between 1962 and 2000 Nigeria's real GDP grew by a mean of 2.43 percent. A disaggregation of this growth rate shows that the growth in output was driven primarily by capital deepening. Capital intensity rose by a mean of 4.80 percent over the period while labour productivity grew by a marginal rate of 0.05 percent. However, over the same period productivity decelerated by a mean of -2.85 percent.

Secondly, an analysis of the trends in Nigeria's productivity growth shows that technical inefficiency was mainly responsible for the poor productivity performance. Technical efficiency declined by -1.29 percent per annum (or 56 percent of the decline in productivity growth) between 1962 and 2000, while technical change declined by -1.01 percent per annum (or 44 percent of the decline in total productivity growth) over the same period.

The study also found significant volatility in all the output and input variables, especially total factor productivity (TFP) and labour productivity (LP). We found that the growth rates of all the output and input variables were higher during the pre-adjustment period 1962-1985 compared to the adjustment period1982-2000.

When we compared Nigeria's productivity performance with those of the countries at the frontier, using the United States as an illustrative example, we found that Nigeria's productivity in relation to the US has weakened over the years. Labour productivity in Nigeria decreased from 5.85 percent of the U.S. level in 1961 to 2.2 percent of the U.S. level in 2000. The widening productivity gap between the two countries is a clear indication of the absence of convergence.

Determinants of Productivity

Several factors have conditioned productivity growth performance in Nigeria. These factors were discussed under five broad dimensions.

(i) The Fruits of Knowledge

This relates primarily to the role of technology in development. Technology could can? be acquired or developed using at least three channels: research and development (R&D), technology transfer, and the adoption of new technology. We found Nigeria's activities in these three broad areas to be quite limited. Unfortunately, economic reform programmes adopted in the past have given limited attention to the issues of technology. R&D remains one of the weakest links in Nigeria's development process, with very low spending by private firms and the government. While technology transfer policy in the past favoured technology imports, the economic crisis of the 1980s has affected the continuous reliance on this policy. Technology adopted in the Nigerian manufacturing sector is quite old and antiquated. The impact of FDI is also restricted mainly to the oil sector. The weak linkage between the oil sector and the rest of the economy hinders any possible spillover effects from this type of FDI. We also found that the low levels of absorptive capacity in the economy limit the country's ability to effectively utilize the technological assets available to her.

(ii) The Results of Accumulation

We found that the quality of human capital in Nigeria is not only low but has deteriorated over the years. This was worsened by the low public expenditure on education and the brain drain phenomenon which surged in the late 80s through the 90s. The low availability and poor quality of primary inputs, labour and capital also have an impact on the country's productivity performance.. The fragmentation of internal markets also affects the efficiency of the labour market. Low private investment prevents firms from being able to replace ageing capital stock with new capital stock that embodies new and generally more efficient technology. Domestic producers identified the poor quality, unreliability and high cost of infrastructures as a major hindrance to their competitiveness. We found that domestic firms depend primarily on bank finance for working capital and investment. However, the inefficiency of the financial sector leaves them with high capital costs. In fact, the micro and small firms are almost completely left out of the formal credit market.

(iii) The Deeper Level

By all indicators, Nigeria can be classified as an open economy. However, while the country is open on the trade side, it cannot be said to be open on the financial side. We found a weak transmission of trade openness indicators to total factor productivity. Factors responsible for this finding include the impact of depreciation on the naira value of imported inputs as well as the uncompetitiveness of domestic firms. The weak institutional environment also played a negative role on the business environment. The Index of Economic Freedom, published by the Heritage Foundation, put Nigeria among countries classified as "mostly unfree".

(iv) Factors that also Matter

Business investment and operations are best conducted in an environment of stability with a minimum level of uncertainty. The Nigerian macroeconomic environment is highly volatile and characterized by uncertainties and high transaction costs. Policy reversals and policy changes are frequent. The seemingly hostile environment altered the preferences of

economic agents for short-term investments rather than longer time more risky investments. We also found the Nigerian corporate sector, including the financial sector, to be highly concentrated.

(v) Other Factors Affecting Productivity

Another factor identified in the report is the low competitiveness of the economy. The various reform policies implemented in the country have focused primarily on improving the price competitiveness. However, for the Nigerian economy to be competitive, price competitiveness is just one of the important considerations. Non-price competitiveness factors like timeliness, quality, marketing and distribution skills, reliability, after-sales services, technological innovation and the institutional structural environment are equally important. We also identified high macroeconomic volatilities in the economy as also playing a role in productivity trends.

Policies that Impact on Productivity

Various policies have played a role in the productivity trend in Nigeria, some of these having a direct impact, and others an indirect impact on productivity.

A. Policies that Have a Direct Impact on Productivity

Until the 1980s, Nigeria had neither a full-fledged Ministry of Science and Technology (S&T) nor a body of coherent national policy on S&T. While this has changed to some extent, S&T policies generally do not attract a high premium in the government policy agenda. Budgetary allocation to the sector is also quite low and direct government policy to support business R&D is also unavailable.

The establishment by the government of institutions with productivity related objectives like the National Productivity Centre (NPC) the National Manpower Board (NMB) and training institutions like the Administrative Staff College of Nigeria (ASCON); the Centre for Management Development (CMD); the Industrial Training Fund (ITF); the National Centre for Economic Management and Administration (NCEMA); the National Institute for Strategic Studies (NIPSS), etc should ordinarily enhance the productivity performance of the country; however, the operations of these institutions have been hampered by a lack of the budgetary support needed to enable them to fulfill their mandate.

The Nigerian educational policy was intended to encourage the development of science and technology through the 6-3-3-4 policy and the universities admission guideline, which recommends a 60:40 ratio in favour of science related courses. In addition, the number of tertiary institutions as well as their enrolment has increased significantly over the years. However, the implementation of these policies and guidelines has fallen short of expectations. The rapid increase in tertiary admissions did not translate to a corresponding increase in the quality of the graduates of these tertiary institutions.

Furthermore, in respect of product quality and standards, the Nigerian government set up two organizations - the Standard Organization of Nigeria (SON) and the National Agency on Food and Drug Administration (NAFDAC) to monitor the quality and safety of goods

produced or sold on the Nigerian market. Rules concerning sanitary and phytosanitary standards, testing and labeling are relatively well defined, but bureaucratic hurdles slow down the approval process. The two organizations are also hampered by the lack of funds and technical capacity and sometimes by bickering with each other.

B. Policies that have an Indirect Impact on Productivity

There are also a number of policies that have an indirect impact on the productivity trend in Nigeria. High up in the list of these policies are the trade, exchange rates and industrial policies. Nigeria's trade policies over the years have fluctuated between protectionism and liberalism. In the pre-SAP era, trade policy was overwhelmingly protective. However, the deliberate policy of maintaining an overvalued exchange rate and protective tariff created weak and sleepy firms that were unwilling to compete and innovate. In the post-adjustment period, trade policy has deemphasized protection and import substitution and favored export promotion. However, the effectiveness of these policies in achieving their objectives was hampered by the sharp decline in real income, which has been the dominant factor behind the poor manufacturing growth performance,and credibility problems relating to the sustainability of the policies.

Furthermore macroeconomic policies pursued for most of the period were anti-growth and fueled volatility in the economy. High and persistent fiscal imbalances translate into high public debt and since monetary policy was generally accommodating, it fueled inflationary rates. The shallow financial market adversely influences interest rates and risks also crowding out private sector credit in the face of the government's large borrowing requirements. The weakness of the capital market did not allow it to serve as a substitute for the weak financial sector. All of these work together to stifle much needed funds required by the real sector both for working capital and to finance investment.

The infrastructure policy which in the past precluded private sector participation resulted in inefficiency and a high cost of public provision of infrastructure services. However, current policy reforms in respect of the infrastructure sector have shifted the frontiers of private sector involvement in the management and financing of this sector. Nigerian and foreign investors are now operating in telecommunications, power, airways, and energy sectors among others.

The Land Use Act was a major constraint to business investment in Nigeria. The Act, introduced in 1976, conferred land ownership on the state. However, the bureaucracy and costs associated with its operations was a major constraint to investment activities. Recently, the President promised to pursue the amendment of this controversial Act in order to ensure unfettered property development and the industrialization of the country.

Constraints to Productivity Growth in Nigeria

Among the most important constraints to productivity growth in Nigeria are, first, the absence of a consistent and long-term strategy for productivity improvement; secondly, the extensive dominance of the public sector in the economy, which stifles private sector initiatives and operations; thirdly, the very weak corporate linkages among the various sectors of the economy – business linkages facilitate innovation, higher productivity through specialization and flexibility in meeting customer needs, and enables economies of scale; fourthly, the weak linkage between the educational system and the requirements

of the economy; and fifthly, the poor functioning of the labour and capital markets. In addition, productivity has been largely hindered by the inefficient state of the physical and social infrastructures. Government involvement in business R&D in the past was limited to tax incentives provided for R&D activities, without directly providing funds to support business R&D.

Possible Actions to Overcome Constraints to Productivity Growth in the Country

These include, first, making the financial sector highly responsive to the needs of the real sector for investment. In respect of the labour market, it must be made more flexible. The government must fund business-related researches and provide more direct support for innovation. The intellectual property environment, including copyright and patents, must be strengthened to encourage private initiatives. The government's current effort to improve the macroeconomic environment and to re-orientate its budgetary allocation to favor social and economic infrastructures is a step in the right direction. There is urgent need to address the observed technological weaknesses in the country. There is limited R&D activity and the capacity of the country to absorb technological innovation is quite weak. The government must seek ways to redress this limitation. A corollary of the above is the need to strengthen existing feeble institutional linkages across business firms, technical departments of universities or polytechnics, and government research laboratories.

Areas of UNIDO support

The report acknowledges that UNIDO has made significant contributions to productivity enhancement in Nigeria. Nevertheless, the report makes suggestions as to the various channels through which UNIDO can further support the Nigerian government in improving productivity growth. UNIDO can support capacity building, human resource development, and the provision of equipment and management systems. It can support government efforts in data collection, processing and dissemination. It could assist in curriculum development and bridging the gap between educational and government research institutions on the one hand and the needs of the private sector and the economy on the other. It can sponsor periodic conferences that will allow for interaction between employers and educational authorities. The organization can also fund the dissemination of research findings of the universities and research institutes and provide technical support for firms willing to commercialize these research findings.

I. Productivity performance in Nigeria: Introduction

1.1 Overview and Context

This report provides an analysis of productivity growth in Nigeria. Based primarily on data supplied by UNIDO spanning the period 1962-2000, it seeks to achieve three key objectives: to analyse productivity trends in Nigeria between 1962 and 2000; to identify and assess the key determinants of productivity performance over this period; and to describe, discuss and analyse the policies adopted by Nigeria and potentially having an explicit or implicit impact on productivity growth.

A study on productivity growth in Nigeria is important for a number of reasons. First, sustained economic growth can only be achieved through a sustained growth in productivity. Rapid-output growth fueled primarily by accumulating factor inputs cannot continue indefinitely, mainly because of diminishing returns. Secondly, Nigeria's development experience shows that the past growth strategy based on factor accumulation is both infeasible and sub-optimal. In other words, faced with a binding financial constraint, Nigeria no longer possesses the financial resources to support continued accumulation of productive inputs and imports. There is, therefore, an urgent need to emphasize factor efficiency. Finally, higher productivity is a key to poverty reduction, which is an important policy objective of the Nigerian government.

Nigeria is a mono-product economy that depends heavily on oil. However, the importance of the oil sector in Nigeria rests essentially on its fiscal linkages. Crude oil revenue generated over US$350 billion or about 95 percent of the total foreign exchange earned in the economy between 1960 and 2003. Oil exports provide the major source of foreign exchange needed to finance critical imports and the bulk of government revenue. Attempts to diversify the economy over the years have yielded only marginal results.

The net impact of oil on the economy remains an open debate. Oil has played the classic role of the good, the bad, and the ugly. Although it eased financial constraints to development, especially in the 1970s, it introduced significant distortions and volatility into the Nigerian economy. The low diversification index of the export base of the economy ensures easy transmission of the fluctuations in the highly volatile world oil market into the economy. The illusion of oil wealth has also pushed consideration for productivity growth to the background.

1.2 An Overview of the Structure of the Nigerian Economy

The Nigerian economy shares most of the characteristics associated with a developing economy, with the primary sector dominating both production and exports. Agriculture dominates the production and employment structure, accounting for about 41 percent of GDP and nearly 70 percent of total employment in 2001, while comparative figures for the industrial and services sectors as a percentage of GDP over the same period are 20 percent and 39 percent respectively. The manufacturing sector contributed only 6 percent of GDP in 2001. Table 1.1 shows that agriculture and public administration are the major

driving forces for the economy. Both grew at 4.6 and 4.5 percent respectively between 1982 and 2001, while the two industrial sub-sectors of manufacturing and construction grew at less than 1 percent, thereby constituting a drag on overall GDP growth.

Table 1.1: The Changing Structure of GDP in Nigeria 1960-2002 (Percent)

GDP by Industry of Origin	1960	1970	1980	1985	1990	1998	2001	% Growth 1982-01
Agriculture	62.9	48.8	22.2	35.1	39.0	36.6	41.1	4.6
Oil and Mining	1.2	10.1	26.8	16.5	13.2	15.6	11.0	1.7
Manufacturing	4.8	7.2	5.4	10.7	8.1	7.5	6.0	0.9
Construction	4.8	5.1	8.5	1.8	1.9	2.2	2.3	0.1
Electricity, Gas and Water	0.4	0.7	0.5	0.7	0.6	0.7	0.6	2.8
Transport and Communication	4.9	2.8	4.1	4.8	3.4	4.0	3.1	1.2
Trade and Finance	12.4	12.8	25.0	19.8	21.4	25.2	21.5	2.3
Public Admin and Defence	3.3	6.5	4.5	6.1	8.4	11.4	10.9	4.5
Others	5.3	6.0	3.0	4.5	4.0	1.6	2.9	3.2
GDP at Factor Cost	100.0	100.0	100.0	100.0	100.0	100.0	100.0	3.0

Sources: (1) Federal Office of Statistics. Annual Abstract of Statistics, various years, Lagos.
(2) CBN Annual Reports and Statement of Accounts, Various issues

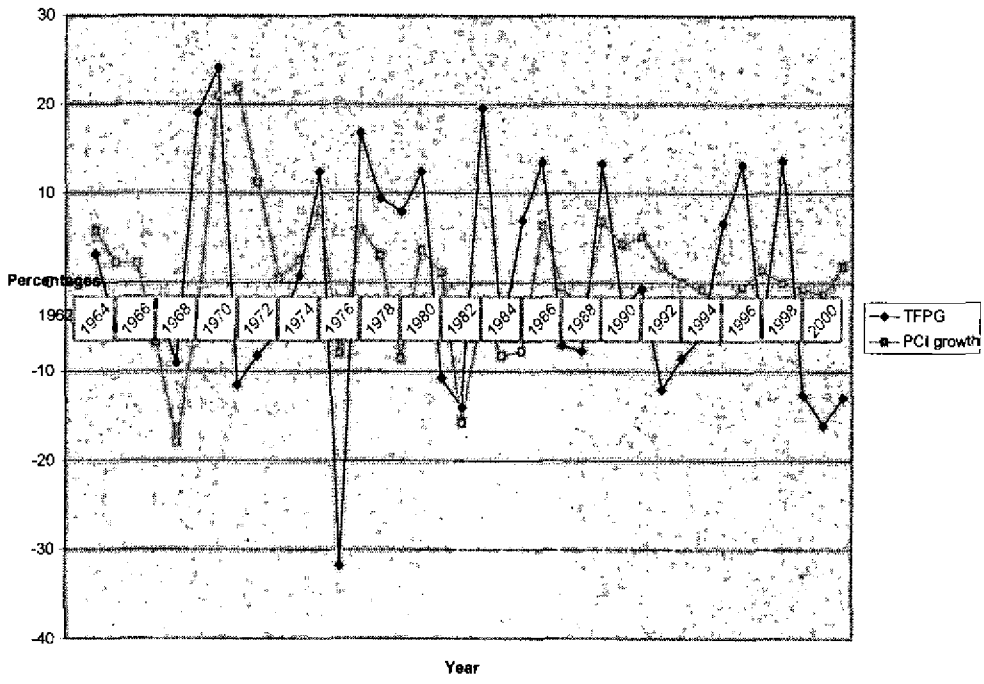
In terms of fiscal structure, oil dominates the economy. In fact, in the last three decades, the contours of Nigerian economic growth have totally depended on developments in the oil sector. The reason for this is very clear. Oil accounted for 81.6 percent of total federally collected revenue in 1980. This rose to 83.9 percent in 1990 before declining to 76.5 percent in 2001. The declining share of oil in government revenue is due mainly to the growing importance of value added tax. In addition, oil serves as the main source of foreign exchange for the Nigerian economy. Its share of foreign earnings rose by 8 percentage points from 90.9 percent in 1980 to 98.7 percent in 2001. The high degree of openness of the economy implies that impulses in the global oil market are easily transmitted into the domestic economy.

Like most African countries, Nigeria depends on primary exports, and the small share of manufactured goods in total exports limits the capacity to import. Oil earnings provide the foreign exchange needed to finance the huge appetite of the economy, especially the manufacturing sector, for the import of capital and intermediate goods. Thus, developments in the global oil market have a direct impact on domestic industrial performance and the conduct of domestic economic activities. Moreover, since the Nigerian government is the repository of oil revenue, fluctuations in oil revenue often result in major contractions in public investments and, by extension, aggregate domestic investment (Olofin, Adenikinju and Iwayemi, 2002).

Nigeria's economic growth trend has fluctuated very significantly. On the basis of official national income statistics published by the Federal Office of Statistics (FOS), the estimated rate of economic growth during the 70s was an average of 5.6 percent. However, this declined sharply to -0.008 percent in the 80s. Between 1981and 1990, output recorded negative growth rates in five years. There has been some growth recovery in the 1990s. The average growth rate of output between 1990 and 2002 stands at 3.0 percent per annum.

One of the causes of the declining trend in per capita income in Nigeria in the past two decades can be traced to declining productivity growth. Figure 1.1 shows that the low growth in per capita income in the past two decades also coincides with low growth in total factor productivity (TFP)[1].

Figure 1.1 Trend in TFP and GDP Per Capita



[1] The Spearman correlation coefficient between TFPG and growth in per capita income is 0.2833 and the associated probability is 0.0848 which implies that the correlation coefficient is significant at 8 percent.

1.3 Trends in Productivity

Following the work of Solow, output growth can be decomposed into growth in factor input and productivity growth. The former refers to factor accumulation while the latter refers to improvement in efficiency. Krugman (1994) classified the growth based primarily on factor accumulation as "perspiration" and that driven primarily by productivity growth as "inspiration". According to Krugman, since capital is subject to diminishing returns, economic growth driven largely by "perspiration" is not sustainable in the long run. Thus, he regarded the growth experiences of the former Soviet Union and the Asian Tigers as unsustainable since they were driven primarily by capital accumulation.

According to UNIDO data, Nigeria's real GDP grew by an annual rate of 2.43 percent in the period 1962 – 2000. A disaggregation of this growth rate shows that the growth in output was driven primarily by capital deepening[2]. Capital intensity rose by a mean of 4.80 percent over the period while labour productivity grew by a marginal rate of 0.05 percent. However, over the same period productivity decelerated by a mean of -2.85 percent. This implies that the growth in capital intensity during this period has been largely inefficient. Labour productivity is important because it gives information about the potential of the economy to raise the standard of living.

Growth in TFP measures the increases in economic growth that cannot be explained by increases in capital and labour inputs. An economy can improve the level of total factor productivity either by improving technical efficiency and/or by improving the technological level (shift in the production frontier); hence an analysis of the trends in the productivity growth of Nigeria shows that technical inefficiency was mainly responsible for the poor productivity performance. Technical efficiency declined by -1.29 percent per annum (or 56 percent of the decline in productivity growth) between 1962 and 2000, while technical change declined by -1.01 percent per annum (or 44 percent of the decline in total productivity growth) over the same period.

Figure 1.2 shows the trend in the growth of output, capital intensity, labour productivity and total factor productivity over this period. A quick analysis of the figure shows significant volatility in the variables, especially total factor productivity and labour productivity. TFP declined 23 times, labour productivity 18 times compared to capital intensity and output that experienced negative growth 10 and 13 times respectively. This implies that the country has not been able to sustain a positive growth in productivity which, more than any other variable, has experienced the greatest volatility in its growth rate. This is further corroborated by Table 1.1.

[2] The dominance of capital in the growth performance of most developing countries has been attributed to the absence of complementary inputs. It is argued that these countries, "lacking other inputs of all kind, use physical capital as a substitute for those scarce missing inputs". Causa and Cohen (2004)

Figure 1.2: Trends in Growth of Output, Capital Intensity, Labour Productivity and TFP

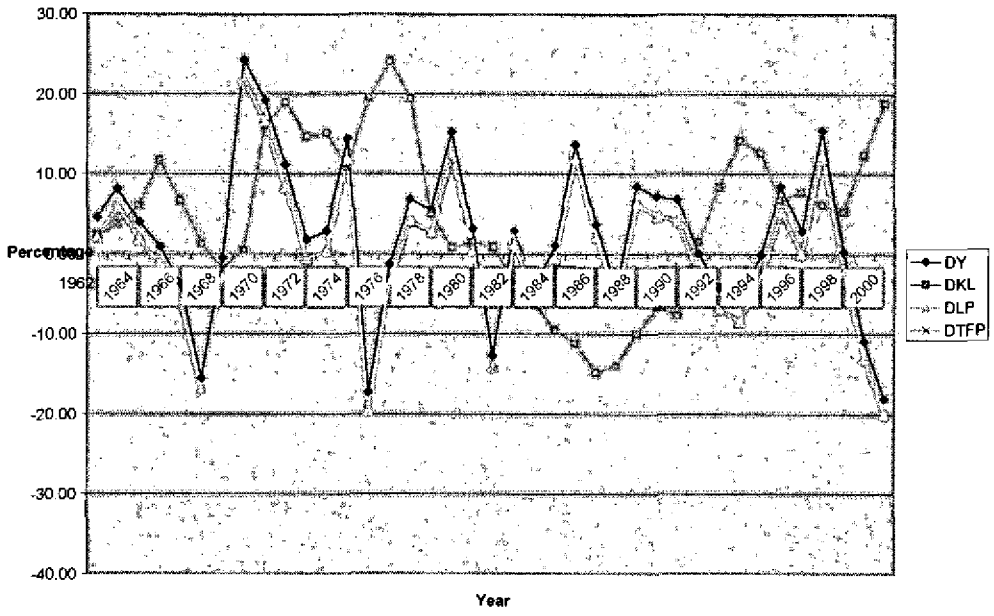


Table 1.2 presents a description of the data. The table reveals significant fluctuations in the growth rate of all the variables over the period covered by the study. Using standard deviation as a measure of volatility, total factor productivity continued to have one of the highest measures of volatility. Its growth rate varied from the height of 21.4 percent in 1969 to the lowest growth of -31.6 percent in 2000. The variability in technical efficiency was even more dramatic. It peaked in 1970 with a growth of 30.9 percent and then descended to its lowest rate of -34.4 percent also in 2000.

Table 1.2: Data Description

Variable	Mean	Median	Max.	Min.	Std. Dev.
		1962-2000			
DEFFCH	-1.295	-1.900	30.90	-34.40	14.641
DKL	4.799	5.292	24.059	-14.783	10.093
DLP	0.046	0.301	21.674	-19.999	9.304
DTFP	-2.851	-1.700	21.400	-31.600	11.659
DY	2.428	2.908	24.229	-18.054	9.514
TECHCH	-1.008	0.300	9.100	-17.900	6.418

Where:

DEFFCH = Change in technical efficiency
DKL = Capital deepening
DLP = Labour productivity growth
DTFP = TFP growth
DY = GDP growth
TECHCH = Technical change

Figure 1.3: Trends in TFP, Technical Change and Technical Efficiency

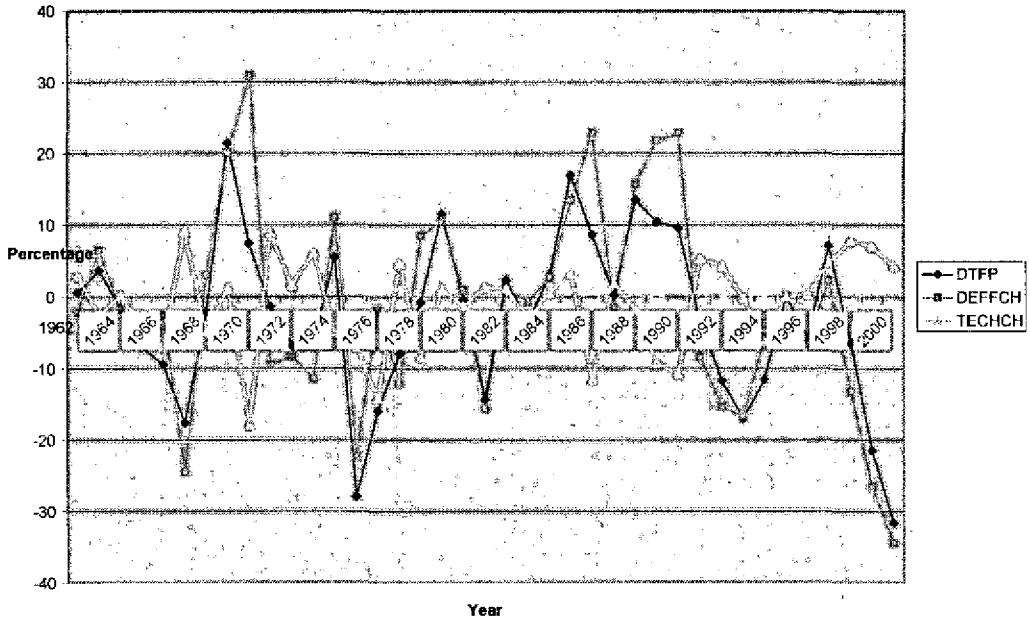


Table 1.3 shows the relationship among the various sources of growth. The table confirms the existence of an inverse relationship between capital intensity and productivity performance. This suggests capital inefficiency in Nigeria. In fact, we found a negative relationship between capital intensity and other growth components of labour productivity and even output growth. This contrasts with the positive correlation obtained between output growth, labour productivity growth and total factor productivity growth.

Table 1.3: Correlation Matrix

	DEFCH	DKL	DLP	DTFP	DY	TECHCH
DEFCH	1.000					
DKL	-0.509	1.000				
DLP	0.798	-0.194	1.000			
DTFP	0.889	-0.614	0.887	1.000		
DY	0.785	-0.166	0.999	0.873	1.000	
TECHCH	-0.611	0.041	-0.183	-0.187	-0.179	1.000

Where:

DEFFCH = Change in technical efficiency
DKL = Capital Deepening
DLP = Labour productivity growth
DTFP = TFP growth
DY = GDP growth
TECHCH = Technical change

A number of factors are responsible for the observed capital inefficiency in Nigeria. The high rate of capital accumulation which took place at the height of the oil boom in the 1970s was carried out without due consideration for productivity and the appropriateness of the acquired capital equipment for the country. Other factors include the obsolescence of capital equipment in Nigeria. The downturn of the economy, starting in the early 1980s, coupled with restrictive trade and exchange rate policies during the period and the high cost of imports after the adoption of SAP in the mid-1980s, made capital replacements much more difficult. This led to a predominance of old inefficient capital stock in the capital structure mix of the economy. A related factor is the low capacity utilization of existing capital due partly to the poor availability of complementary infrastructure and inputs such as energy inputs.

However, the secular trend in output growth and its sources described above masked significant variations in GDP growth, factor inputs growth and productivity growth over the study period. The period 1962-2000 covers different epochs in the economic and political history of the country. The oil sector, in particular, has played a key role in the growth episodes. The country experienced two oil booms in the 1970s followed by an oil crisis in the 1980s. Similarly, while the oil boom period coincided with a period of significant government interventions in the economy, the post-1986 period was characterized by economic liberalism. Politically, during the period 1962-2000 the country alternated between democratic governance and military autocracy and was under military rule for 28 years out of the 38 years covered by the study; hence, to aid our analysis we subdivide the period of study into two periods: 1962-1985 and 1985-2000.

[A] 1962-1985

This period is often referred to as the pre-adjustment period. We can further subdivide the period into the oil boom period of 1962-1980 and the period of economic recession of 1981-1985. During the period 1962-1980 the country experienced two oil booms, 1973/74 and 1979/80, and was awash with petrol dollars as the price of oil surged in the world market, bringing significant resources into the economy. This period was characterized by heavy public sector involvement in the domestic economy. At the height of the boom the government declared its intention to take over the "commanding heights of the economy". The policy focus during this period was an import-substitution industrialization strategy marked by restrictive trade policy especially for the light manufactures and consumer goods sector. It was a period of significant incentives for the manufacturing sector which the government policies during this period were targeted to favour. Such policies included an overvalued exchange rate designed to reduce the cost of imported inputs, subsidized credit and energy costs, and heavy investment in economic and social infrastructure. Trade policy was also designed to protect domestic firms against competition from outside. The Indigenization Decree was also introduced during this period to increase Nigerians' ownership of economic activities.

This period also coincided with three and a half years of civil war, three military coups and a successful transfer of power from military to civilian government in 1979. However, the period from 1970 to 1980 was relatively very stable except for an unsuccessful military coup in 1976. The petrol dollars also helped to mitigate the negative

impact of the civil war on the economy. In fact, the massive reconstruction efforts after the civil war in 1970 helped the growth of the economy.

The short-run impacts of these measures on growth are shown in Table 3. Real GDP grew by a mean of 4.42 percent, the highest growth rate during the period. Labour productivity also grew by nearly 2 percent per annum. However, it is obvious that the growth was largely driven by "perspiration" rather than "inspiration" and therefore clearly not sustainable. Capital intensity rose by over 9 percent while total factor productivity regressed by nearly 3 percent per annum. The fall in productivity growth was due to both declining technical efficiency and negative technical change. The emphasis during this period was never on improving productive efficiency. However, it is safe to say that this period was "the golden era" of the manufacturing sector in Nigeria. . Its share of GDP and exports was the highest, and capacity utilization was at its peak.

The second sub-period, 1981-1985, was a dramatic period in Nigeria's economic history. The profligacy of the civilian government and its inability to manage the impact of the slump in the world oil price on the economy led to economic recession in 1982. The public sector deficit went up, and inflation and unemployment rates rose. The reversal of the country's economic fortune was quite sharp and drastic. Per capita income fell significantly. Policy response, apart from being slow, emphasized demand management and hardly focused on expanding the economy's supply response capacity. The economic crisis and its mishandling led to two military coups within a space of 36 months.

The slump in public investment between 1981 and 1985 was associated with a decline of 4.27 percentage points in output growth. Real output growth was barely positive at 0.15 percent per annum. Capital intensity and labour productivity declined by -5.9 percent and -1.4 percent respectively. Interestingly, the marginal growth in output during this period was driven by growth in total factor productivity, especially technological changes. Technical efficiency also rose, albeit marginally, as producers responded to the government's highly restrictive trade and exchange rate policy. Domestic producers found it very difficult to import intermediate inputs and capital equipments.

[B] 1986 – 2000

This is the adjustment era. The structural adjustment programme (SAP) was introduced in 1986. Its implementation in the late 1980s was to bring about structural changes in the economy and a shift in focus to supply. Elements of the reform included emphasis on private-sector-led growth and a roll back of public sector dominance of the economy. Between 1986 and 2000, real output grew by a mean of 0.67 percent. Capital intensity rose by an annual mean of 2.7 percent while labour productivity and total factor productivity fell by -1.8 percent and -4.0 percent respectively. Table 3 shows that volatility of TFP was higher during the SAP period than in the pre-SAP period. Output volatility was, however, lower in the SAP period.

Table 1.4: Data Description

Variable	Mean	Median	Max.	Min.	Std. Dev.
		1962-1985			
DEFFCH	-0.317	-1.300	30.900	-24.600	12.718
DKL	6.109	4.306	24.059	-11.233	9.669
DLP	1.224	0.785	21.674	-19.505	9.880
DTFP	-2.133	-1.550	21.400	-28.000	10.938
DY	3.5289	3.051	24.229	-17.332	10.125
TECHCH	-1.433	0.350	9.100	-17.900	6.513
		1986 – 2000			
DEFFCH	-2.860	-5.700	22.800	-34.400	17.658
DKL	-2.703	6.081	18.794	-14.783	10.736
DLP	-1.839	-2.304	12.309	-19.999	8.272
DTFP	-4.000	-3.600	13.500	-31.600	13.043
DY	0.669	0.300	15.433	-18.054	8.476
TECHCH	-0.327	0.300	7.800	-11.600	6.425

Where:

DEFFCH = Change in technical efficiency
DKL = Capital Deepening
DLP = Labour productivity growth
DTFP = TFP growth
DY = GDP growth
TECHCH = Technical change

Table 1.5 shows a downward shift in all the variables between the pre-SAP and SAP periods. Output and capital intensity, though still positive, declined during the adjustment period. Labour productivity reversed its positive growth to become negative while deceleration in TFP increased between the two periods. Interestingly, during the pre-adjustment period technical change exerted the more significant impact on TFP growth; however, after the introduction of SAP technical efficiency took over as the more important determinant of TFP growth. Between 1962 and 1985, the pre-adjustment era, technical change declined by -1.43 percent per annum, compared to -0.32 percent per year in technical efficiency. However, in the post-adjustment era, 1986-2000, the order of importance was reversed, with technical change falling by -0.33 percent per year compared to a decrease of -2.86 percent per year in technical efficiency. This suggests that since 1986 technical efficiency has been the main constraint on the achievement of high levels of total factor productivity. While SAP brought about improvement in technological change, technical efficiency regressed relative to the pre-SAP period.

Table 1.5: Trends in Indicators of Growth, Factor Input and Productivity over the Period

Period	Description	DY	DKL	DLP	DTFP	DEFFCH	TECHCH
1962-80	Oil boom period	4.42	9.27	1.93	-2.92	-0.45	-1.97
1981-85	Economic recession	0.15	-5.88	-1.44	0.86	0.18	0.62
1986-92	Adjustment period	2.52	-6.16	0.24	3.84	8.23	-3.20
1993-94	Post-adjustment	-2.92	13.39	-5.71	-14.35	-11.25	-3.30
1995-2000	Renewal	-0.31	9.49	-2.97	-9.70	-13.00	4.02
1993-98	Guided deregulation	3.53	8.76	0.63	-5.63	-6.58	1.05
1999-2000	Return to democracy	-14.44	15.56	-16.52	-26.55	-30.50	5.60
1962-1985	Pre-adjustment	3.53	6.11	1.22	-2.13	-0.32	-1.43
1986-2000	Adjustment	0.67	2.70	-1.84	-4.00	-2.86	-0.33

Source: calculated from data supplied by UNIDO.

Where:

DEFFCH = Change in technical efficiency
DKL = Capital deepening
DLP = Labour productivity growth
DTFP = TFP growth
DY = GDP growth
TECHCH = Technical change

However, one of the observations from Table 1.5 is that the behaviour of the productivity and output variables was not even throughout the period 1986-2000. Basic economic policies under SAP were suspended in 1993 after the military coup that ushered in General Sani Abacha. However, because of the worsening economic state of the country, NXP a policy of guided deregulation was introduced in 1995. There was also significant political uncertainty in the country following the annulment of the presidential election results by the Babangida military junta in 1993. The annulment exerted a significant impact on macroeconomic performance until the restoration of democracy in 1999. Between 1985 and 2000 the country had five Heads of State and at least three unsuccessful coup attempts. The uncertainty which characterized the economic landscape took its toll on the economy as Nigeria also became a pariah nation.

Table 1.5 shows that the 'pure' adjustment era, 1986-1992, was associated with improvements in output growth, labour productivity and total factor productivity. Technical efficiency was at its peak during this period, while capital intensity and technological change recorded negative growth. It was clear that these initial positive responses were not sustained for the remaining part of the period. The suspension of the adjustment programme in 1994 reversed all the earlier gains in output and productivity growth. While capital intensity rose from 1993 to 2000, productivity growth remained negative throughout the period.

Thus, in summary, if Nigeria had been able to sustain its economic growth in the pre-SAP era, real GDP would have doubled in about 20 years. However, if the growth rate during the adjustment period continues, it will take the country nearly 105 years to double her GDP, hence, there is an urgent need to boost productivity.

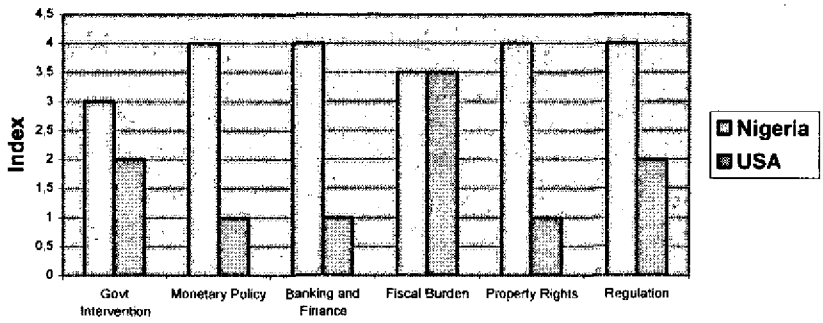
1.4 International Comparison of Productivity

The last section of this chapter provides a comparison between the productivity performances of Nigeria and those of the countries at the frontier, using the United States of America as a representative of this group of countries. Productivity difference is one of the explanations for differences in economic growth. Convergence to the leader is a sign of a successful development programme.

According to the UNIDO data, Nigeria's productivity relative to the US has declined over the years. Labour productivity decreased from 5.85 percent of the US level in 1961 to 2.29 percent in 2000. The widening productivity gap between the two countries is a clear indication of the absence of convergence. There are several reasons for the productivity divergence between the two countries. The first set of reasons border on issues of poor governance in Nigeria manifested in the weak enforcement of property rights and the rule of law in general, and pervasive corruption. These create disincentives to new investment in starting up new firms and/or in expanding existing firms. The second factor relates to the poor educational status of Nigeria relative to the US. Low quality education reduces human capital and impedes the adoption of new technologies. Thirdly, there are greater restrictions on economic transactions in Nigeria due to restrictions on international trade, state monopolies and excessive regulations, all of which reduce incentives for the innovation and investment needed to boost productivity. In addition, the high instability in the economic environment and the absence of institutions to provide incentives for individuals and firms in the economy also weakens productivity growth in Nigeria. Finally, there is a widening technological gap between the two countries. Competitiveness in the modern economy is largely driven by technology and information. Nigeria is highly disadvantaged in both areas.

In Figure 1.4, we compare the Index of Economic Freedom between Nigeria and the United States. The higher the score on a factor, the greater the level of government interference in the economy and the less economic freedom a country enjoys. Except in the case of fiscal burden, where the two countries have the same figure, in general Nigeria's ranking on other factors is higher than that of the USA, suggesting a weaker institutional environment in the country.

Fig. 1.4: Comparative analysis of Index of Economic Freedom, USA and Nigeria, 2003



II. Assessment of the major determinants of productivity

2.1 Reflections

The previous chapter describes the trends in productivity growth in Nigeria between 1962 and 2000. A number of observations were made in respect of the productivity trends.. These include the fact that, on average, productivity growth was generally low during the period of the study. Secondly, there was significant volatility in productivity growth trends. Thirdly, output growth was driven primarily by capital accumulation, which accounts generally for the non-sustainability of positive growth in output recorded during the period of the oil boom. Fourthly, we also show that, relative to countries on the production frontier, productivity growth in Nigeria was non-converging and the productivity gap between Nigeria and the USA widened between 1961 and 2000.

Hence, the main objective of this chapter is to identify the key determinants of total factor productivity growth in Nigeria. Central to the discussion of productivity in Nigeria is the role of the manufacturing sector. This is because the cumulation of firms' competitiveness determines the competitiveness of countries. In Nigeria the oil sector is mainly an enclave with very minimal non-fiscal interactions with other sectors of the economy. In spite of its fiscal linkages the oil sector cannot rival the manufacturing sector in terms of the latter's potential for extensive backward and forward linkages with the rest of the economy. The agriculture sector, though the largest sector of the economy, still needs the manufacturing sector to pull it up from its low productivity and low-income trap. Even the services sector will only truly develop as higher productivity is achieved in the manufacturing sector, leading the latter to be in a position to release resources to the modern services sector. Thus, arguably, the low productivity growth in Nigeria is a mirror of the low productivity performance of the manufacturing sector. Previous studies by Chete and Adenikinju (1995), Adenikinju and Soludo (1997) and Adenikinju and Chete (1999) showed a very low rate of manufacturing productivity growth in Nigeria. Similar to the aggregate economy, the above studies also reported that growth in the manufacturing sector, especially in the pre-SAP era, was driven by input accumulation rather than efficiency.

Hence, our discussion of the determination of productivity growth in this chapter will give primacy of place to the manufacturing sector, although, where essential, references will be made to the overall economy. Evidence of the low productivity trend in the manufacturing sector includes: a low share of manufactured exports in total exports; a low share of medium and high engineering exports in manufactured exports: and concentration of the manufactured sector in low value added goods. In 1999 Nigerian per capita value added in manufacturing was estimated at approximately US$13, which corresponds to about 10 percent of the level of Botswana, and less than 50 percent of that of Ghana and Kenya. Manufactured exports per capita in Nigeria in 1999 were less than US$1 per capita (UNIDO/CSAE, 2002).

Table 2.1 provides a snapshot of some indicators of performance in the Nigerian manufacturing sector between 1980 and 2001. The sector's share of GDP rose from 5.4 percent in 1980 to its peak of 8.1 percent in 1990 before declining to 6 percent in 2001.

The manufacturing sector doubled its share of exports between 1980 and 2001 as its contribution to total exports rose from 0.3 percent in 1980 to 0.6 percent in 2001. Nevertheless, the sector remains a net user of foreign exchange, contributing less than 1 percent to foreign exchange earnings and utilizing nearly 81 percent of foreign exchange earned in the economy in 2001. The 1 percent of foreign exchange generated by the Nigerian manufacturing sector compares very poorly with 94 percent in Korea, 96 percent in Hong Kong or even 34 percent in Indonesia (a country which shares many features with Nigeria). Manufacturing employment is also very low. In 1999 the industrial sector employed about 10 percent of the population compared to 70 percent in agriculture and 20 percent in services percent.

Table 2.1: Selected indicators of Performance in the Nigerian Manufacturing Sector

Indicator	1980	1990	1992	1998	2001
Share in GDP (%)	5.4	8.1	7.9	7.5	6.0
Share in total exports (%)	0.30	0.67	0.53	0.6	0.6
Capacity utilization (%)	75.0	36.92	35.44	30.4	39.6
Share of total imports (%)	60.3	73.3	65.6	88.8	80.7
Value of manufactured export (million naira)	39.0	730.8	1095.5	4134.4	12707.9
Manufacturing employment ('000)	294.2	340.1	NA	328	
Manufacturing value added per capita (at 1984 constant prices)	5,194.0	7,361.4	7,657.2	6587.5	6596.7

Sources: Adenikinju (2003)

Table 2.2 shows some dimensions of the structure of Nigeria's manufacturing sector. The sector is dominated by low wages, low technology, production of light consumer goods and resource-intensive and labour-intensive industries. There is concentration at the lowest rung of all the categories. In 1993, for instance, 69 percent of all industries relied on low technology, and 18 percent and 13 percent on medium and high technology respectively. 59 percent of MVA comes from the consumer goods sector, and 28 percent and 13 percent are from the intermediate and capital goods sectors respectively. The corresponding figures for South Africa were 40 percent, 41 percent and 19 percent respectively.

In terms of orientation, 41 percent of Nigeria's MVA is from resource-intensive sectors, while 23 percent each are from scale-intensive and labour-intensive sectors. Science-based and specialized suppliers only account for 1 percent and 4 percent respectively. Finally, 62 percent of MVA is from the low-wage sector and only 12 percent is from the high-wage sector.

Table 2.2: Comparative Structure of Nigeria, South Africa and Senegal Manufacturing Sector, 1993

Categories	Nigeria	South Africa	Senegal
1. Type of Product			
(a) Consumer Goods	59	40	72
(b) Intermediate goods	28	41	24
(c) Capital Goods	13	19	4
2. Level of Technology			
(a) Low	69	61	87
(b) Medium	18	21	28
(c) High	13	18	6
3. Orientation			
(a) Resource intensive	41	34	68
(b) Scale intensive	23	2	10
(c) Labour intensive	23	16	16
(d) Specialized supplier	4	11	1
(e) Science based	1	6	5
4. Wage Type			
(a) Low	62	41	76
(b) Medium	26	23	18
(c) High	12	16	6

Source: Adenikinju and Olofin (2000)

2.2 Determinants of Productivity in Nigeria

Several factors have conditioned productivity growth performance in Nigeria. Following UNIDO's classification, these factors have been grouped into five broad dimensions. These are:

(a) The fruits of knowledge: creation, transmission and absorption of technology;
(b) The results of accumulation: factor supply and allocation;
(c) The deeper level: invariants, integration and institutions;
(d) The factors that also matter: competition, the social dimensions and environmental concerns;
(e) Other factors.

The above factors are discussed seriatim below.

(a) The Fruits of Knowledge

This is perhaps the most important determinant of productivity in Nigeria. It is the major factor behind the low productivity level and growth that the country had experienced since independence in 1960 and its inability to translate the capital accumulation growth recorded during the period of the oil boom into technical and productive efficiency.
Technology is a major determinant of competitiveness. It is perhaps the main driver of efficiency in the modern economy. Resource endowment alone is no longer sufficient to confer sustained comparative advantage in a particular line of business. Developing technological capability is very central to fashioning out a strong and competitive economy with a vibrant industrial sector. However, given the quasi-public nature of

technology, the government has an important role to play in facilitating the pace, depth and extent of technology development.

Technology can be acquired or developed using at least three channels:

(a1) Research and development
(a2) Technology transfer
(a3) Adoption of new technology

Nigeria's activities in these three broad areas have been quite limited. While the country has a Ministry of Science and Technology, and a number of Research Institutes, there has been very limited success either in imitating, copying or developing new technologies. Unfortunately, economic reform programmes adopted in the past have given limited attention to the issues of technology.

The low technological development of the country has also placed her at a disadvantage in positioning herself to benefit from current internationalization of the production, distribution and marketing of goods and services. Evidence has shown that only industries linked to information technology are able to take advantage of global market opportunities and also benefit from the relocation of labour-intensive production, and the distribution and marketing of goods and services from high-labour-cost countries, mostly OECD countries. With inadequate infrastructure and high transactional costs, Nigeria has not benefited from the production relocation or trade induced by the information technology revolution.

Ayonrinde, Adenikinju and Adenikinju (1998) provide a relatively detailed study of technological acquisition in the Nigerian manufacturing sector. According to their survey results, technical activities in the manufacturing sector are quite limited. Table 2.3 provides information about the technical dependence of the surveyed firms at start-up. Most of the firms started out without any serious technical support. Only 13 percent and 23 percent respectively signed agreements on trademark license or on technical services. The few that had technical support actually obtained this from local consultants. Only 12 percent of the respondents had agreements with foreign consultants. The table further shows that only 22 firms (25 percent) of the respondents have a research and development department. These 25 percent are firms in the large-scale sector and are more or less multinationals. Most often than not, these firms depend on their international parent bodies for any new development in the technological frontier. In addition, much of R&D efforts carried out by Nigerian firms are mainly upgrading of machineries rather than introducing new products. About 40 percent of the respondents claimed they had introduced new products in the past five years. The mean investment in technical services by the firms was N8.0 million, and on technical assistance, N9.0 million. These amounts are clearly very small.

Table 2.4 shows various forms of technical improvements in initial technology performed by firms in the sample. Most technological activities were in the area of adaptation to local raw materials as a result of the high naira cost of imported foreign input after economic reforms. The increased competition arising from trade liberalization led to greater efforts to upgrade installed technologies. This might not be unconnected to the fact that some firms would be expected to introduce technical changes in production as part of their adaptation to the new economic policies. Thirty-seven percent of the firms that reported technical activities

reported that they manufactured new tools/dies/fixtures. Nineteen percent of firms were involved in the development of new processes.

Table 2.3: Number (Percentage) of Firms that Reported Technical support at Start-Up

Form of Technical Support	Yes	No
1. Has an R&D Department	22(25%)	64(68%)
2. Signed agreement on trade-mark license	12(13%)	80(85%)
3.Signed agreement on technical services	23(25%)	69(73%)
4. Signed agreement on technical assistance	11(12%)	81(86%)
5. Agreements on technical management	12(13%)	80(85%)
4. Agreements with foreign consultants	11(12%)	81(86%)
5. Agreements with local consultants	26(28%)	65(69%)

Source: Ayonrinde, Adenikinju and Adenikinju (1998)

Table 2.4: Percentage of Firms that Carry out Any of the Following Technical Changes

Types of technical changes	Percentage of firms
1. Downsizing of the production process	20.5
2. Adaptation to local raw materials	48.3
3. Energy saving	20.0
4. Capacity stretching	22.1
5. Manufacture of new tools/dies/fixtures	36.7
6. Development of new processes	18.8

Source: Ayonrinde, Adenikinju and Adenikinju (1998)

(a1) Research and Development Efforts

Research and Development (R&D) is likely to increase productivity. The OECD (1993, in Guellec and van Pottelsberghe de la Potterie 2001) defines R&D as comprising "creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock of knowledge to devise new applications". R&D can contribute to improvement in productivity by providing new technologies and applications or by reducing the resource requirements of existing products (Connolly et al, 2004). According to the OECD, there is an important linkage between R&D and productivity growth. OECD (2000) reports that "countries with large increases in the intensity of business R&D to GDP and in the share of business R&D in total R&D, appeared to have experienced a pick up in productivity growth in the 1990s". For most of the OECD countries, business R&D expenditure exceeds government expenditure on R&D. The average of business expenditure

on R&D for a group of 19 OECD countries for the period 2002-03 was 1.22 percent of GDP, compared to the government's 0.30 percent of GDP and higher education's 0.37 percent of GDP (Connolly, et al, 2004). R&D also facilitates a country's ability to absorb technology developed elsewhere. Griffith et al (2000) argues that "R&D stimulates growth directly through innovation and also indirectly through technology transfers".

However, R&D remains one of the weakest links in Nigeria's development process. There is very low spending by private firms on R&D. Multinational enterprises are not willing to invest init, while indigenous companies rarely engage init. Government-owned research institutes such as the Federal Institute of Industrial Research, Oshodi (FIIRO) and other research institutes have had a negligible impact because of poor funding and the gap between research findings and the needs of the corporate sector[3]. In addition, there is also a weak corporate linkage among the firms as the level of sub-contracting is very low thereby limiting capacity for the growth of indigenous technology. This is due to a number of reasons including the weak capital goods sector, the inadequate technical facilities to process raw materials of the right technical specifications and quality, uncertainty of suppliers arising from irregular production and supply schedules, and the relatively exorbitant prices of some local raw materials compared with imported counterparts (Ayonrinde, Adenikinju and Adenikinju, 1998).

Data on R&D in Nigeria is very scarce. The snippets of information available, however, have shown very limited R&D activities. The number of researchers on R&D (per million people) declined from 17.09 persons in 1985 to 15.15 persons in 1987. As Ayonrinde et al (2002) also shows, only 22 percent of the firms included in their survey have an R&D department. Furthermore, most of the research undertaken in government institutes of higher education is more basic than business R& D and thus takes more time to affect productivity.

The low consideration for R&D in Nigeria is therefore one of the major causes of the low productivity trap. Given that large firms are more inclined to undertake R&D and because many of the large firms in Nigeria are foreign firms that are often reluctant to conduct R&D outside their home base, especially in the developing countries, the government must play a more prominent role in stimulating R&D. There is a strong causality between public R&D and private R&D, and therefore a need for joint public-private collaboration to solve production problems. State intervention to promote Science and Technology in general, including R&D, is allowed under the laws of the WTO. For instance, the Chinese government favours technology transfers and R&D functions when it screens applications submitted by foreign companies to set up plants in the country (Amsden, Tschang and Goto, 2001).

[3] Among other factors that have contributed to low R&D spending in Nigeria are the following: Only large firms invest in R&D in Nigeria, whereas we have a predominance of small firms. Secondly, poor enforcement of basic copyright and patent protection rights limits the ability of firms to internalize the benefits of innovations arising from R&D investments. There are also problems arising from the limited pool of scientists and engineers as well as the high-cost environment which leaves firms with little resources to finance R&D. Moreover, there is low support for commercialization of R&D products and services. Successful commercialization requires the availability of complementary assets like finance, marketing and competitive manufacturing and the ability to link these together.

(a2) Technological Transfer

This is another means by which technology could be acquired. Technological transfers are embodied in plant and equipment, intermediate and final goods imports, inward FDI, such as multinational enterprises embodied in expatriate personnel, plant and equipment, intermediate and final goods, training provided to employees, intra-firm and inter-subsidiary movement of staff, outward FDI (through reverse technology transfer), and through other means such as turn-key projects, consultancy projects, licensing and franchising (Narula, 2004). Sakurai et al (1996) note that one of the means by which firms receive benefits from the R&D of other firms is by purchasing technologically sophisticated inputs or capital goods for their production process.

Indicators of technology transfer include the vintage of technology and FDI flows. Technology adopted in most sectors of the Nigerian economy is quite old and antiquated. The liberal trade regime in the 70s and 80s had allowed for the importation of new machinery and equipments at a very low tariff rate. Similarly, the over-valued exchange rate made technology acquisition quite cheap. This was also a period when a number of multinational enterprises flocked into the economy, though mainly to set up assembly plants and produce import substitutes as well as take advantage of the largest market in the sub-region. Capacity utilization was also at an all-time high during the 70s.

However, the economic difficulties which started in the early 1980s together with the economic reform programmes adopted since 1986, have not contributed significantly to encouraging technology transfers. Several surveys carried out in the manufacturing sector show that technology in the sector is quite old and antiquated. Most of the firms use equipment that was imported mainly before the onset of structural adjustment programmes (SAP) According to the survey reported in Ayonrinde et al (1998) the mean age of equipment used by manufacturing firms was 11 years. Many of the firms also purchased second-hand equipments from Europe and other parts of the world. According to Teitel et al (1994), the age of equipment provides some indication of the modernity of the technology in use as well as the expected productivity of a given manufacturing plant.

Foreign Direct Investment (FDI) is an important harbinger of technology. However, Nigeria has not really been a favoured country in terms of non-oil FDI inflows. Net FDI as a percentage of GDP rose from 1.63 percent in 1970 to 3.11 percent in 1971 but declined to 1.71 percent in 1985. By 1990 FDI was a mere 2.06 percent of GDP (see figure 2.1). However, when we examine FDI as a stock, inward FDI stock as a percentage of GDP rose from 3.7 percent in 1980 to 42.4 percent in 2000 and further to 49.0 percent in 2002. The resurgence of FDI in recent years has gone to the oil sector, which has very limited linkage with the economy and thus can only contribute marginally to productivity growth in the economy in general or in the manufacturing sector in particular. In 2000-2002 Nigeria ranked 98th on the UNCTAD FDI potential index (UNCTAD, 2004).

Figure 2.1: Foreign Direct Investment, net inflows (% of GDP).

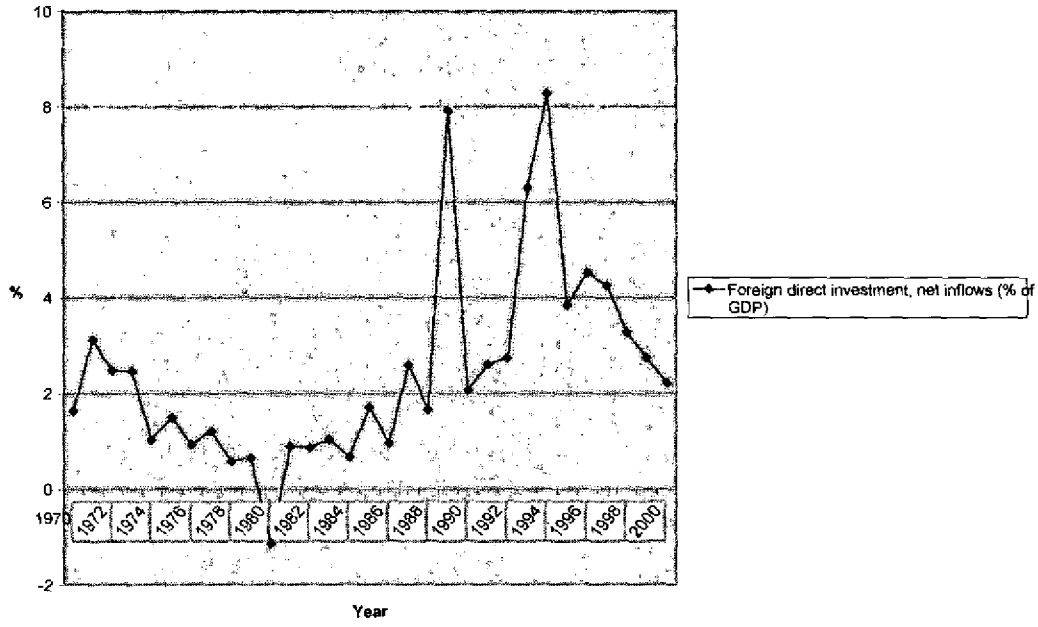
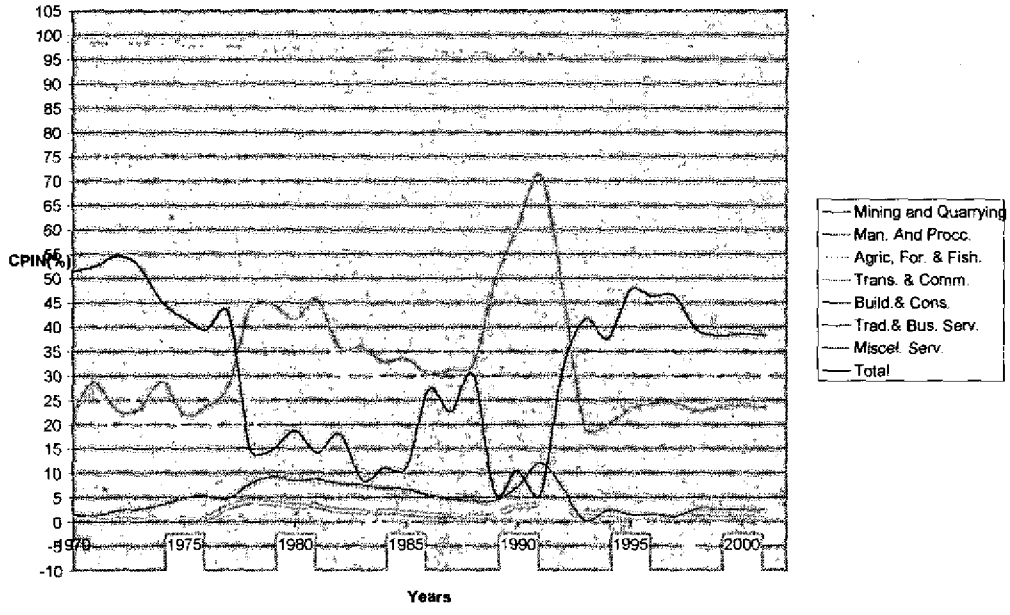


Figure 2.2 shows the sectoral flow in foreign private investment in Nigeria.

Figure. 2.2: Cumulative Foreign Private Investment in Nigeria, analysed by type of activity



Even when we examine the distribution of FDI that goes to the manufacturing sector, Table 2.1 shows that it is concentrated in the low productivity, highly protected, consumer goods sector. The seemingly high share of FDI in machinery and equipment was in vehicle assembly plants that were set up in the 1970s to take advantage of the huge domestic market. The weak intersectoral linkage in the economy also limits the scope for technology spillovers from the multinational enterprise (MNEs) to domestic firms.

Table 2.5: Percentage Distribution of Foreign Direct Investment in the Nigerian Manufacturing Sector in 1988

Sector	Industry	FDI
1	Food, beverage and tobacco	0.22
2	Textiles, wearing apparel and leather	0.18
3	Wood, wood products, and furniture	0.02
4	Paper, paper products, printing and publishing	0.09
5	Chemicals, rubber and plastic products	0.20
6	Non-metallic mineral products	0.07
7	Fabricated metals, iron and steel	0.07
8	Machinery and equipment	0.15

Source: Adenikinju and Chete (2000)

Further evidence of the limited contribution of FDI to productivity growth in Nigeria is the low share of manufactured exports in total exports. According to World Bank data, the share of high technology exports in total manufactured exports was 1.19 percent in 1996 and only 0.4 percent in 2000.

(a3) Adoption of New Technologies

Even where technological assets are made available – either through licensing or indirectly through spillovers from inward FDI, the domestic sector may not be in a position to internalize these assets (Narula, 2004). A country will be able to benefit from technology if it has a certain minimum level of absorptive capacity. Dahlman and Nelson (1995) define national absorptive capacity as the ability to learn and implement the technologies and associated practices of already-developed countries. Narula (2004) identifies four components of absorptive capacity. These are basic infrastructures, which include roads, railways, telephones, electricity, hospitals, etc; advanced infrastructure (universities, advanced-skilled human capital, research institutes, banks and insurance firms); firms (domestic firms with appropriate human and physical capital to internalize technology firms), MNEs' affiliations, and, finally, formal and informal institutions such as intellectual property rights regimes, competition policy which depicts government policies designed to promote "inter-linkage between the different elements of assumptions capacity as well as to create opportunities for economic actors to absorb and internalize spillovers".

The technological assets of a country include ownership of plants, equipment and the technical knowledge embodied in its engineers and scientists. Firms cannot absorb outside knowledge unless they invest in their own capacity to innovate. This in turn is a function of the firms' innovative efforts which depend on their formal and informal R&D as well as the training they provide to their employees and also the knowledge infrastructure of the country. Smith (1997) defines this knowledge infrastructure as being generic, multi-user and

indivisible, and "consisting of public research institutes, universities, organizations for standards, intellectual property protection, etc, that is the infrastructure that enables and promotes science and technology development. Guellec and van Pottelsberghe de la Potterie (2000) argue that if "firms from a country want to take full advantage of international spillovers, they have to spend on R&D: the free rider approach clearly does not work".

Boresnszein et al (1998) show that at country level a minimum threshold of absorptive capacity is necessary for FDI to contribute to higher productivity growth. Narula and Marin (2003) also show that only firms with high absorptive capacity are likely to benefit from FDI spillovers. Xu (2000) posits that a country needs to reach a minimum human capital threshold in order to benefit from technology transfers. The absence of sufficient levels of absorptive capacity tends to lead to the inefficient use of technology flows.

Using the infrastructure indicators data in Tables 2.6 - 2.8 it is obvious that the absorptive capacity of Nigeria is not only very low, but is also in a very weak position relative to countries at the technology frontier. Looking at the basic infrastructure, Nigeria's electricity consumption is 0.8 percent of the average for frontier-sharing countries. Health expenditure per capita, which was a mere US$7, was only 0.3 percent of the average of countries at the frontier. Similarly, Nigeria had only 9.3 percent of rail lines, 30.0 percent of paved roads, 0.7 percent of telephone mainlines per 1000 people, 83.9 percent of primary school enrolment and 26.1 percent of secondary school enrolment of the average of countries at the world technology frontier. In addition, with regard to advanced technology, Table 2.8 shows that tertiary school enrolment in Nigeria was only 6.9 percent of what obtains on the average for frontier-sharing countries. Other indicators of absorptive capacity also show that the country was not quite in a position to take advantage of technological advancement in other parts of the world. Internet users (per 1000 people) rose from 0.19 in 1997 to 0.703 in 2000, a figure still quite low by international standard. Scientific and technical journal articles declined from 780 in 1981 to 405 and 397 in 1997 and 1999 respectively.

Table 2.6: Indicators of Basic Infrastructure

	Electric Power Consumption (kwh per cap)	Health expenditure per capita (Current US$)	Hospital bed (per 1000 people)	Rail lines (total km)	Roads paved (%of total)	Telephone mainlines (per 1000 people)	School enrolment primary % gross	School enrolment secondary % gross
Pre-catching up								
Peru	810	104	1	1691	12	64	124	74
Mexico	1482	234	1	17697	32	108	114	64
Venezuela	2553	181	1	336	34	112	97	52
Nigeria	83	7	NA	3357	25	4	87	31
Pakistan	341	18	NA	7791	44	20	71	25
Viet Nam	217	16	2	3142	25	23	112	56
Average	881	93.33	1	5702.3	28.67	55.17	100.83	51.0
As % of frontier	8%	4%	12%	16%	34%	9%	97%	43%
Catching-up								
China	722	34	2	58656	22	77	115	65
India	349	22	NA	62759	52	24	99	46
Malaysia	2341	100	2	1622	74	191	102	64
Brazil	1750	317	3	25652	8	136	132	78
Argentina	1817	640	3	28291	29	197	112	85
Chile	2058	340	3	4184	17	189	101	72
Average	1506.17	242.17	2.60	30194.0	33.67	135.67	110.17	68.33
As % of frontier	14%	9%	32%	84%	40%	22%	106%	58%
Pre-frontier								
Korea	4793	503	5	3123	73	445	96	100
Singapore	6277	879	NA	NA	98	456	95	74
Hong Kong	5128	NA	NA	NA	100	564	94	73
Average	5399.33	691.0	5.0	3123.0	90.33	488.33	95.0	82.33
As % of Frontier	51%	27%	61%	9%	108%	80%	92%	69%
Frontier- sharing								
Canada	15293	1892	5	39400	NA	642	100	105
US	11863	4017	4	160000	60	648	101	97
Japan	7272	2627	16	20165	70	648	101	104
Denmark	6041	2732	5	2047	100	663	102	124
Germany	5681	2842	10	36652	99	571	104	102
Netherlands	5786	2070	11	2902	90	581	108	130
Norway	24010	2846	15	NA	75	607	101	117
Sweden	14261	2558	4	10068	77	698	108	149
UK	5351	1577	4	17067	100	552	108	140
Average	10617.56	2573.44	8.22	36037.6	83.88	611.56	103.67	118.67
As % of frontier	100%	100%	100%	100%	100%	100%	100%	100%

Source: Narula, R (2004)

Table 2.7: Indicators of Advanced Infrastructure

	School enrolment Tertiary (% of gross)	Scientists & Engineers (per million people)	Public Spending on education (% of GDP)	Subsidies & other transfers (% of expend)	Tax revenue (% of GDP)	Highest marginal tax rate corporate
Pre-catching up						
Peru	27	230.	3	33	14	30
Mexico	18	232	4	47	13	35
Venezuela	28	192	NA	NA	14	34
Nigeria	4	NA	NA	NA	13	30
Pakistan	4	NA	3	15	13	NA
Viet Nam	8	NA	3	43	17	32
Average	14.83	218.0	3.25	34.50	14.20	32.20
As % of frontier	26%	6%	55%	53%	47%	104%
Catching-up						
China	6	473	3	NA	6	30
India	8	157	3	40	9	40
Malaysia	17	130	5	23	20	28
Brazil	15	246	5	61	20	15
Argentina	43	695	4	57	12	35
Chile	33	361	4	54	18	15
Average	20.33	343.67	4	47	14.17	27.17
As % of frontier	35%	10%	68%	73%	47%	88%
Pre-frontier						
Korea	66	2160	4	49	17	28
Singapore	41	2957	4	16	16	26
Hong Kong	26	NA	NA	NA	NA	16
Average	44.33	2558.5	4.0	32.50	16.5	23.33
As % of Frontier	76%	73%	68%	50%	55%	75%
Frontier- sharing						
Canada	75	3059	6	65	20	38
US	76	3912	5	61	19	35
Japan	45	5196	4	NA	NA	30
Denmark	52	3322	8	64	33	30
Germany	47	2898	5	58	27	25
Netherlands	50	2437	5	71	41	35
Norway	65	3979	7	70	33	28
Sweden	58	4137	8	69	34	28
UK	54	2484	5	58	33	30
Average	58	3492	5.89	64.5	30	31
As % of frontier	100%	100%	100%	100%	100%	00%

Source: Narula, R (2004)

Table 2.8: Indicators of Formal and Informal Institutions

	Corruption Index 2002	Civil Liberties	Total scientific articles	Internationally authored articles	HDI	Internet users 2001 per 100	Rule of law
Pre-catching up							
Peru	4.0	3	119	105	0.75	7.70	-0.53
Mexico	3.6	2	3095	1418	0.80	3.60	-0.41
Venezuela	2.5	4	641	331	0.78	4.70	-0.81
Nigeria	1.6	5	477	149	0.46	0.10	-1.13
Pakistan	2.6	5	359	143	0.50	0.30	-0.76
Viet Nam	2.4	6	176	141	0.69	1.20	-0.57
Catching-up							
China	3.5	6	13815	3962	0.72	2.60	-0.19
India	2.7	2	10272	1894	0.59	0.70	0.23
Malaysia	4.9	5	618	344	0.79	27.30	0.34
Brazil	4.0	3	6533	2501	0.78	4.70	-0.26
Argentina	2.8	3	2974	1120	0.85	10.10	0.22
Chile	7.5	1	1263	659	0.83	20.10	1.19
Pre-frontier							
Korea	4.5	2	7772	2016	0.88	52.10	0.55
Singapore	9.3	4	2022	678	0.88	41.20	1.85
Hong Kong	8.2	NA	2393	1053	0.89	38.70	1.37
Frontier- sharing							
Canada	9.0	1	24498	8665	0.94	46.70	1.70
US	7.7	1	183906	39669	0.94	50.10	1.58
Japan	7.1	2	52711	9275	0.93	38.40	1.59
Denmark	9.5	1	5795	2813	0.93	42.90	1.71
Germany	7.3	1	47714	18340	0.92	37.40	1.57
Netherlands	9.0	1	13712	5654	0.94	49.10	1.58
Norway	8.5	1	3542	1589	0.94	46.40	1.83
Sweden	9.3	1	11093	4887	0.94	51.60	1.70
UK	8.7	1	49221	16806	0.93	33.00	1.61

Source: Narula, R (2004)

A4. Information and Communications Technology

It is important to acknowledge the role that developments in the information and communications technology (ICT) sector could play in productivity growth. Researchers have found links between ICT and productivity growth, although the method by which the ICT sector impacts upon productivity remains controversial. Gordon (1999) finds that all of the increase in labour productivity in the U.S. is associated with increased labour productivity in the ICT-producing sector. Jorgenson and Stiroh (1999) also report that increases in U.S. productivity growth are predominantly associated with increased productivity in the production of ICT, rather than the industries that intensively use ICT. IMF (2000), however, noted that "not all higher productivity countries have a significant IT producing sector".

However, no matter the channel through which ICT affects productivity, whether through an ICT-producing sector or an ICT-using sector, the positive impact of ICT on productivity seems to be less contentious. Pilat and Lee (2001) find "that differences in

ICT production and use contribute to recent growth patterns across countries". They also go on to report that there is "also a strong positive correlation between indicators of ICT use, such as the numbers of secure servers, internet host density and internet access costs, and the pick-up in MFP growth in the second half of the 1990s".

Table 2.9 shows the relative performance of Nigeria with selected countries in ICT in 2003. A number of points can be inferred from the table. First, internet access is most expensive in Nigeria. The internet total monthly price per 20 hours of use in Nigeria is 9 times the amount paid in South Korea and more than two and a half times the amount paid in another Africa country, South Africa. Another indicator of ICT cost is the ratio of the internet monthly price to Gross National Income (GNI) per capita. While this ratio is less than 1 percent in the USA, it is 353.7 percent in Nigeria and only 1.2 percent in South Korea. The high cost of internet access is therefore a major factor in the low usage of the internet in Nigeria. The number of internet users per 1000 people was a mere 3.5 in Nigeria compared to 68.2 in South Africa and over 500 in bothin South Korea and the U.S.A . Another indicator of ICT use is the number of secure internet servers. In this, Nigeria performed abysmally with only three secure internet servers in 2003 compared to 648 in South Africa and over a million in the U.S.

Table 2.9: Indicators of ICT Usage in Selected Countries, 2003

Indicators	Korea	Nigeria	South Africa	USA
1. ICT expenditure per capita (US$)	644.[a]	NA	225.06[a]	2357.92[a]
2. Internet total monthly price per 20 hrs of use	9.74	85.48	33.33	14.95
3. Internet total monthly price as % of monthly GNI per capita	1.2	353.7	15.4	0.5
4. Internet users per 1000 people	551.89[a]	3.50[a]	68.20	551.38
5. Secure Internet servers	688	3	648	138514.0

Note: [a] refers to 2002.
Source: World Bank World Development Report CD-ROM

Table 2.10 shows the extent of computer and internet applications in businesses in Nigeria. The table, derived from the UNIDO/CSAE survey, shows very limited application of computers among Nigerian business firms, especially among micro and small-scale firms. Computers per employee were only 0.04, while only 18 percent on average of the firms that have internet access use them for sales and marketing.

Table 2.10: Information Technology

	All	micro	small	medium	large
1. Have computers	0.65	0	0.24	0.68	0.95
2. Computer per employee	0.04	-	0.20	0.07	0.04
3. Internet access	0.44	0	0.05	0.05	0.04
4. Use of the internet facility and sales if they have internet access	0.18	0	0.16	0.46	0.70
5. Use the internet for ordering materials if they have internet access	0.38	0	0.33	0.06	0.22
6. Use computers in management if they have computers	0.64	0	0.33	0.24	0.44
7. Use computers for accounts if they have computers	0.74	0	0.70	0.52	0.64
8. Mean hardware spending as a proportion of the capital stock for firms that spend on hardware	0.016	0	0.22	0.68	0.89
9. Mean software spending as proportion of the capital stock for firms that spend on software	0.004	0	0.023	0.017	0.014

Source: UNIDO/CSAE 2002

Table 2.10 confirms the limited spending of firms on both hardware and software. Firms that spend on hardware, spend on the average about 1.6 percent of their capital expenditure on hardware, and firms that spend on software spend 4 percent of their capital expenditure on software.

However, recent reform policies in the telecommunication sector have brought some hope to the sector. In 2003, there were 853,100 telephone main lines in use and 3,149,500 mobile cellular phones. There were 1,142 internet hosts in 2004 and 750,000 internet users in 2003 (CIA, 2005).

Access to technology imports is, however, going to be more difficult once the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) comes into force. The WTO established a framework of rules on a minimum level of protection of intellectual property rights (IPR) and the means to ensure their enforcement. These rules concern the protection of patents (for inventors), trademarks, geographical indicators, and industrial designs of integrated circuits, including undisclosed information as well as the protection of copyrights, etc.

A 1999 survey of the likely impact of TRIPS on technology imports on Nigeria yields a number of interesting results. Fifty-five percent of the respondents believed/said that TRIPS would affect technology imports by increasing the cost of procuring technology (12 percent), creating difficulty in having access to new foreign technology (7 percent), and both (36 percent). In terms of adjustment response to the likely negative impact of TRIPS, 97 percent

of the respondents indicated they would buy a license and about 1 percent indicated they would commence R&D. However, the model results show that firms that have R&D are not likely to be significantly affected by WTO agreements on IPR. Firms, however, may need to be supported by the government through a special technology fund to enable them to buy a license to raise capital at low cost to encourage industrialization (Adeyemo, 1999).

(b) The Results of Accumulation

The productivity determinants under this broad heading are very critical to productivity trends in Nigeria. They interact with the first group of determinants highlighted in the previous section to explain Nigeria's relatively poor productivity performance. Human capital has been undermined by low government investment in education and health and the incidence of brain drain and, more recently, the HIV/AIDS pandemic. The rising share of low-quality graduates from our educational institutions coupled with low and declining investment spending by firms also has consequential impacts on the quality of factor inputs available to the economy. Other factors such as the weak physical and financial infrastructure base and the structural rigidities in the economy have contributed quite significantly to the unimpressive productivity trends. We examine each of these key factors in this section.

(b1) Human Capital

Human capital represents an important bridge in a country's capacity to absorb technology from other parts of the world. Human capital proxy by education and health indicators is quite important in explaining productivity. Human capital theory suggests that knowledge and skills are a function of education, training and experience" (Laplange and Bensted, 1999). While education improves the adaptability of the labour force to new ideas and technology, training is related to tasks that directly affect the employment activities of the employee (Laplange and Bensted, 1999). Human capital directly affects the ability of a country to take advantage of both the 'new economy' and developments in R&D (Connolly, et al 2004). Several studies have confirmed the positive impact of human capital on productivity. Gunnarsson et al. (2001) report that their "hypothesis of complementarity between IT and highly-skilled workers is confirmed". Barrett and O'Connell (1991) find that "general training has a statistically positive effect on productivity growth". Gemmel (1996) points out that while tertiary education is more important for economic growth in developed countries, it is primary and secondary education that are more important for economic growth in developing countries. However, as Tables 2.6 and 2.7 above clearly show, Nigeria has not been doing very well in the indicators of human capital – primary, secondary and tertiary school-enrollment ratios.

Human capital received massive investment at the height of the oil boom. Public expenditure on health and education were at an all-time high. Public expenditure on education as a percentage of GDP declined from an average of 4.1 percent between 1970 and 1979 to 2.8 percent between 1990 and 1999. There was a rapid expansion in the number of universities and polytechnic institutions and in admissions to these. However, many would argue that the expansion proceeded too rapidly. The sharp cut in public sector investment in the education and health sectors after the adoption of the economic adjustment programme affected the provision of education and health services with a

significant impact on productivity. Public health expenditure as a percentage of GDP was below 1 percent throughout the 1990s. The percentage share marginally increased from 0.3 percent in 1997 to 0.4 percent in 2000. Only 21 percent of the labour force population in 1995 had primary education. Another measure of the quality of education is pupil-teacher ratio (primary school). This ratio rose from 34.08 in 1970 to 42.28 in 1985 before dropping to 37.21 and 33.78 in 1995 and 1996 respectively. This indicator simply shows that the quality of education has hardly improved from the 1970s to meet the exigencies of modern technology. Tables 2.11 and 2.12 present trends in the indicator of student-teacher ratios at various education levels in Nigeria. Information in the tables confirms the poor quality of education in the country.

Table 2.11: Pupil-Teacher Ratio: Country Analysis, 1992, 2000

Country	Primary	Secondary
Industrialized	18	14
Sub-Saharan Africa	26	26
Ghana	29	18
Malaysia	20	19
South Africa	27	26
Nigeria – 1992	39	27
- 2000	54	41

Sources: UNDP Development Report, 1992
CBN Annual Reports and Statement of Accounts, 2000

Table 2.12: University Student-Teacher Ratio in Nigeria Tertiary Institutions by Major Academic Disciplines

Session	Discipline	No of students	% of Total	Student/Teacher Ratio	
				Actual	NUC Guideline
1991/1992	Science	40068	17.7	14:1	10:1
	Engineering/Tech	20971	9.3	19:1	9:1
	Social Science	30830	13.7	27:1	20:1
2001/2002	Science	169200	151	40:1	10:1
	Engineering/Tech	81263	8.3	48:1	9:1
	Social Science	183641	18.6	69:1	20:1

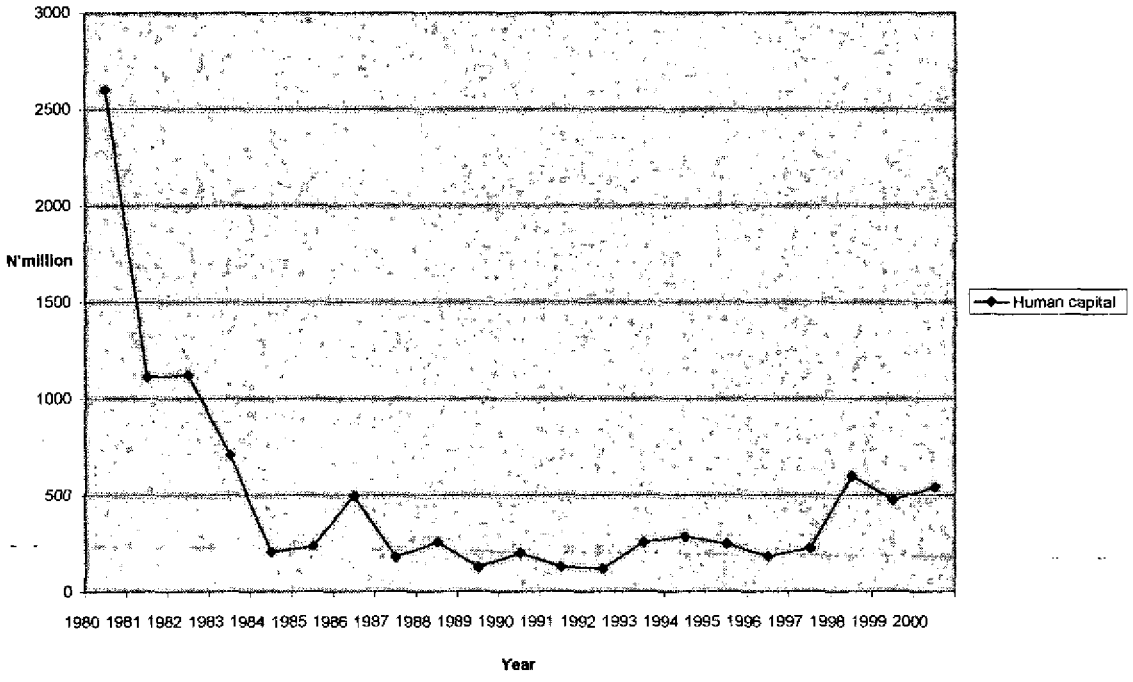
Source: National University Commission (NUC)
Federal Office of Statistics (FOS)

The deteriorating state of human capital was worsened by the brain drain which surged in the late 80s through the 90s. Nigeria lost some of her best brains to other countries, especially in Europe and North America. The combined impact of the deteriorating quality of education and the brain drain is now showing up in the country's productivity growth rate. Firms are compelled to spend huge sums of money on retraining of graduates of the educational system or to fall back on expatriates. Unfortunately, there are not many relevant local training institutions to complement the formal educational institutions. Inadequate training has been a major productivity factor in Nigeria. The National Manpower Board (NMB, 1991) indicates that only 5.34 percent of the total employees were sent for training in 1991 in both the private and public sectors. In the purely private enterprises only 5.14 percent of the employees went on any form of training in 1991.

We created an indicator of human capital by taking the real values of government capital expenditures in health and education. The resultant trend in these values from 1980 is presented in Figure 2.3 below. Since the government remains the largest investor in health and education, at least at the secondary and tertiary levels, the declining trend of government capital expenditures in the two sectors is not a good omen for productivity growth.

The high rate of unemployment is also a constraint on productivity. Adenikinju and Oyeranti (1999) report a positive relationship between educational attainment and the unemployment rate in Nigeria. Brauninger and Pannenberg (2000) find that "unemployment reduces the level of productivity if human capital is productive".

Figure 2.3: Trend in Human Capital Indicator.



(b2) Primary Inputs (Labour and Capital)

The availability and quality of primary inputs – labour and capital – also have an impact on productivity performance. Labour's contribution to productivity has been hampered by, among other factors, the increase in the proportion of relatively inexperienced workers, and by ill-health, the poor quality of complementary inputs, and the high rate of labour unrest, especially in the 1990s. The capacity utilization rate, which declined from a peak of over 70 percent in the 1970s to below 40 percent in 2003, also limited both capital and labour productivity. Similarly, energy shortages, in power and fuel, which became very pronounced in the 1990s, contributed to low capacity utilization in the economy as well as lower productivity. An increasing threat from HIV/AIDS is also gradually taking its toll on labour productivity. The HIV/AIDS adult prevalence rate is

estimated at 5.4 percent. In 2003 over 3.6 million people were estimated to be living with the disease, with related deaths from HIV/AIDS estimated at 310,000 (CIA, 2005).

The input structure of the typical firm in the economy is dominated by foreign inputs. For most sectors, raw materials and capital are largely imported. For instance, in the manufacturing sector, raw materials constitute the single most important input cost element followed by capital. Labour only accounted for 15 percent of total manufacturing cost in 1995, while energy accounted for about 5 percent. These are the two inputs mainly supplied locally, capital and materials being largely imported. While local sourcing of raw materials has been a key industrial and trade policies' goal in Nigeria, the results have been less than encouraging. The average rate of domestic sourcing of raw materials increased only by 11.8 percentage points from 46.1 percent in 1987 to 57.9 percent in 1996. This input structure suggests that manufacturing competitiveness will be highly influenced by trade and exchange-rate-related policies.

The economy-wide productivity of the economy has also been hampered by the inefficiency of the factor markets. For instance, the fragmentation of internal markets affects the efficiency of the labour market. While labour laws are generally pro-market (for example, minimum wage legislation applies primarily to the public sector and there are few restrictions on firms ability to hire and fire staff, etc.), nevertheless the labour market is segmented across geographical zones and sectors, preventing the efficient allocation of labour across different sectors and different markets. Geographical mobility in Nigeria has been hampered by poor communication and transportation facilities and also by social and cultural impediments. A 1997 survey of 424 workers across the country confirms the existence of spatial restrictions on labour mobility. According to the survey results, only 7 percent of Northern workers who changed their geographic location moved to Lagos, the main commercial city in the South, compared to 93 percent who moved to Kaduna, the main commercial centre in the North. Similarly, only 13 percent of Westerners moved to Kaduna compared to 87 percent who moved to Lagos (Adebayo and Oladeji 2001). The study confirms the reluctance of workers to move out of their region of origin in search of employment. Some employers also discriminate on the grounds of sex, religion and ethnicity, in spite of government policy to the contrary.

Adebayo and Oladeji (2001) also confirm limited intersectoral mobility in Nigeria. In 1997 over 53 percent of mobility was within the manufacturing and processing industries, implying the prevalence of intra-industry mobility. According to the authors, employers in the manufacturing and processing industries generally exhibit a preference for job seekers with previous industrial experience. In addition, the weak and slack labour market also limits prospects for mobility. Government policies such as the quota system and the federal character policy, though these affect only the public sector, do, however, affect the overall efficiency of the labour market.

One advantage that employers have is that the real wage rate is generally low in Nigeria and has actually declined over time. However, it is doubtful whether the cost-gain from the low labour cost could compensate for the low labour productivity. In fact, as we argued elsewhere the low labour cost in Nigeria as well as in other African countries could not confer competitive advantage on these countries, because the low labour costs are simply a reflection of low labour productivity (Adenikinju, Iwayemi and Olofin, forthcoming).

Private investment is critical to productivity growth. The channels are very clear. New investment allows firms to replace ageing capital stock with new capital stock that embodies new technology and that is generally more efficient. The enhanced efficiency of capital and labour will also produce an increase in productivity. IMF (1993) showed that one-third of the gap in the trend output growth of SSA relative to all other developing countries during 1971-91 could be attributable to insufficient investment levels. The Nigerian Manufacturing Enterprises Survey (NMES) shows that between 1998 and 2000, only 42 percent of all observations are non-zero investments. The incidence of zero investment is more prevalent with micro and small-scale industries. The study found that investment in equipment and capital was low with more than half of the firms refraining from investing altogether, and with the majority of those investing reporting modest investment rates that implied significant expansion (UNIDO/CSAE, 2002).

According to the Manufacturers Association of Nigeria (MAN) Half-Yearly Economic Review, real capital formation in manufacturing grew by a mean of 5.9 percent per annum between 1981 and 1992. However, post-1986, the annual growth has been largely negative: 1988 (-20.6 percent), 1990 (-5.1 percent) and 1992 (-2.3 percent). 1991 was the only year with a positive growth of 1.5 percent. Manufacturing-sector capital formation decelerated by a mean of -2.7 percent between 1988 and 1992. In 1999, capital formation in manufacturing was dominated by food, beverages and tobacco at 62.4 percent, textiles at 8.5 percent, and basic metals at 10.9 percent (Adenikinju, 2003). The MAN Report shows that between 1993 and 1999, manufacturing investment was distributed as follows: building 9.7 percent; plant and machinery and equipment 84.9 percent, new products 4.5 percent, and others 0.9 percent.

Table 2.13 shows that domestic investment is mainly financed from external sources (i.e., equity and debt). However, in recent years internal funds, especially retained earnings, have assumed some prominence. This implies that falling profits may harm investment. In addition, short-term debt is rising, though marginally, suggesting that rising interest rates could constrain investment. In 1999, the manufacturing sector accounted for 34 percent and 33 percent of total commercial and merchant bank loans respectively in Nigeria.

Table 2.13: Sources of Funds Among Nigeria Quoted Companies 1986 –1998

Source of funds	1986	1998
Internal	16.87	19.66
External	83.13	80.34
Equity	45.02	43.96
Debt:		
Long-term	5.95	6.01
Short-term	49.7	51.53
Bank draft	6.46	9.94
Trade creditors	18.56	14.56

Source: Adenikinju (2002)

(b3) Infrastructure

The literature is unambiguous on the impact of infrastructure on productivity. Aschauer (1990), Latreille and Varoudakis (1996) find a significant relationship between public infrastructure and productivity growth. One of the channels through which public infrastructure affects productivity is the externalities that occur from investment in infrastructure (Connolly, 2004). Canning (1999) shows that transportation and communication infrastructure facilitates the linking of markets as well as increasing the rate of diffusion of technology. The productivity impact of various technologies, however, differs. Canning (1999) posits that "investment in telephones is more productive than investments on average". Nadiri and Mameneas (1994) conclude, on the basis of their study, that there are significant productive effects of publicly-financed infrastructure and R&D capital on productivity growth in U.S. manufacturing. They also find that the most important public capital that exerts the most influence on manufacturing sector growth is the quality and size of the network of infrastructure in the economy, the quality of education and training provided or financed by the public sector, and the extent of technological innovation and R&D supported by the public sector.

Survey reports consistently show that Nigerian producers see infrastructure deficiency – inadequacy, low quality and high cost – as the major constraint to their productivity performance. The high costs and poor quality of the available infrastructure has led to an increase in transaction costs in the business sector. Collier (1997) argues that manufacturing is a transaction-intensive process; hence the high transaction cost is a major constraint on manufacturing competitiveness.

A survey conducted in 1998 on constraints to manufacturing sector productivity performance shows that 90 percent of the respondents identified infrastructure as the most important constraint to the manufacturing sector in Nigeria (Adenikinju, 2003b). An overwhelming proportion of the firms included in the survey regarded power and voltage fluctuations as major obstacles to their operations. Eighty-three percent of the respondents ranked electricity as their number one problem. This was followed in distant second and third places by telecommunications and petroleum shortages respectively. Most Nigerian firms have to make a significant investment in the private provision of generators as insurance against poor publicly-provided electricity. Despite recent efforts by the government to improve the electricity supply, its efforts remain very marginal. Nigeria's current electricity supply is below 4,000MW compared to about 39,000 MW in South Africa, which has a population that is less than one-third of Nigeria's.

Table 2.14: Ranking of Severity of the Infrastructure Problem in Nigeria

Infrastructure	No Obstacle	Moderate obstacle	Major obstacle
Land	8.1	4.9	4.3
Electricity	1.9	10.5	82.7
Water	19.8	13.6	4.3
Telecommunication	1.2	14.8	34.0
Road	13.6	6.8	1.2
Petroleum shortages	22.2	48.1	2.5

Source: Adenikinju (2002)

The dominant response of the private sector to the inefficiency in publicly-supplied electricity is private generation. Over 90 percent of firms have their own generators as a backup to public electricity. The intriguing thing, however, is that many of these firms not only have generators as a back up, but also maintain a back-up to their back-up. In the 1998 survey there was a particular firm that maintained up to 12 generators. There were also some firms that, because of the nature of their production process, depended

completely on autogeneration. This inevitably adds to their cost of operations. The survey results also show that about a quarter of small-scale firms spend more than 30 percent of their initial investment on the provision of their own electricity facilities.

Of course, generators do not provide a complete insurance for the firms against power outages. While the generators minimize the cost of power outages, firms still incur some extra costs from outages. Most of these costs come in the form of lost output followed by the destruction of raw materials and damage to equipment. In a sample of 162 firms in 1998 these costs totaled over half a billion naira. The average cost of auto-generation, N15.27/kWh, was also much higher than NEPA charges of N5.28/kWhin 1998. Similarly, the study calculated the marginal cost (MC) of power outages. The MC is indicative of the amount that the industrial consumers are willing to pay for an improved electricity supply. The MC was estimated at N19.95/kWh.

Table 2.15: Decomposition of Losses by Types

Type	Amount (N)	As % of total
1. Destruction of raw materials	46,696,694	8.42
2. Lost output	462,860,827	83.51
3. Restart Costs	14,126,400	2.55
4. Damage to Equipment	30,540,574	5.51
Total	554,224,495	100.0

Source: Adenikinju (2003b)

A related study focusing on the macroeconomic and distributional consequences of fuel supply disruption also paints a dismal picture of the negative impact of fuel supply shortages on the Nigerian business sectors. Nigeria has faced perennial fuel shortages every year since 1991. The supply shortages, mostly unanticipated, have occurred an average of three times a year since 1991, each shortage lasting weeks or months at a time. This has created a paradox. Why should a country with huge oil reserves and oil production that is several multiples of domestic consumption be faced with an oil supply crisis? The evidence of the oil shortages, whenever they occur, are seen in the long and regular queues at fuel stations that are often empty and the thriving parallel markets that develop very close to the fuel stations and at specific parts of the cities where fuels are sold above the official price. Adenikinju and Falobi (2004) conducted a survey of the economic cost of fuel shortages on economic agents in Ibadan. The study reports that fuel scarcity has a major negative impact on the activities of producers and business operators. This comes in terms of a higher cost of operations (74 percent), a fall in capacity utilization (61 percent), a decline in sales (74 percent), a fall in profits (82 percent) and the lateness of workers coming to the office (32 percent)[4]. The survey results also show that 63.2 percent of the business operators were willing to pay higher prices if that would guarantee a more steady supply of fuel[5].

Other infrastructure constraints include poor road condition, a poor sewage system, a lack of water supply, and the high-cost and poor telecommunication facilities. The

[4] The number in parentheses refers to the percentage of the respondents reporting the effect.

[5] However, with the recent liberalization of the downstream sector, the incidence of fuel shortages has diminished significantly. The high prices of fuel, especially diesel, continue to pose a serious challenge to the competitiveness of domestic firms.

UNIDO/CSAE (2002) study shows that the existence of good roads near a firm increases its underlying efficiency by about 9 percent. The modal structure of the transport system heavily favours roads to the neglect of the rail and water systems. The rail system is particularly important for the industrial sector to be able to move heavy materials, goods and services from and to the ports and other parts of the country. However, successive governments have continued to neglect it, thus imposing heavy costs on manufacturers who have to use the very inefficient road system to transport their goods from the ports to the hinterland or from production units to marketing centres.

The poor state of these infrastructures implies that firms have to devote a substantial part of their investment to producing them or to providing alternatives. As reported by Anas and Lee (1988), firms spend as much as 22 percent of their total investment on machinery and plant on the private provision of these infrastructures. This is a major constraint to the manufacturing sector's competitiveness. The poor transportation system also ensures that firms have to spend money on transportation vehicles for their employees. Firms that cannot afford this suffer productivity losses due to the lateness of workers who have to commute on a chaotic transport network, especially in Lagos.

Table 2.16: Values of Private Infrastructure Provision as a Percentage of the Total Value of Machinery and Equipment

Private provision	Small firms	Large firms	Total
Generators	24.78	10.06	10.42
Boreholes	2.81	1.91	1.91
Vehicles for workers	5.49	2.84	2.86
Vehicle for shipments of goods	10.95	4.47	4.62
Vehicles for garbage disposal	0.15	0.48	0.48
Radio equipment	1.48	0.59	0.59

Small firms are establishment with less than 50 employees
Source: Anas and Lee (1988)

Table 2.17 shows the outcome of a survey of the textile sector in Nigeria. For a sample of textile firms, the domestic costs of inputs and infrastructure are the most important constraints that government policy must address. Until policies are introduced to address these problems, the other efforts of government to address productivity in the country may not work. Thus, until there is a suitable macroeconomic environment that minimizes the transaction cost of doing business in Nigeria, domestic firms are unlikely to be able to compete with their foreign competitors. Opening up the firms to competition under the existing risky environment and high cost of operations is therefore a double jeopardy for these firms and, as there is clear evidence to show, this is one of the reasons why textile firms have been unable to survive under trade liberalization. The experiences of other manufacturers are not significantly different.

Table 2.17: Perception of the Most Important Problems of the Textiles Industry

Problem/Cost	Percentage Ranking as Most Important	Percentage Ranking as Second Most Important
Cost of Local Raw Materials	60.9	8.7
Cost of fuel	26.1	17.4
Cost of electricity	13	17.4
Interest rate	4.3	4.3
Exchange Rate	5.6	0
Excise Tax	5.3	0
Wages	8.7	34.8
Cost of Machine Spare Parts	4.5	4.5
Import Duty on Raw Materials	11.1	0
Import duty on Spares and machines	5.6	11.1
Import Duty on Imported Textiles	0	0

Source: Oyejide, et al., (2003)

(b4) Structural Change of Production

Table 1 in the previous chapter presents the structure of the Nigerian economy. It shows that the economy is dominated by sectors with low productivity growth potential. This has limited the scope for productivity improvement in the country. The Nigerian economy is dominated by sectors with marginal capacity to enhance productivity growth, for example, agriculture and mining, while there is a contraction of productivity-enhancing sectors like manufacturing, construction and electricity. Though the trade and finance sector has grown rapidly over the years, its contribution to the economy's productivity has been limited, first by its relatively limited productivity growth capacity, and secondly by the inefficiencies and uncompetitiveness of the sector.

Productivity in agriculture is very low. Obadan and Odusola (2000) estimated that productivity in the industrial sector is three times higher than in the agricultural sector. In addition, the education level of those in agriculture is very low and does not fit into the needs of the industrial sector. Moreover, the technology of production in the manufacturing and processing sector is capital intensive, limiting the rate of absorption of excess labour from the agriculture sector.

Even the manufacturing sector is dominated by low productivity growth sectors (see Table 2.2). The orientation of this sector is towards producing for the domestic market and for import substitution. Until 1986, the incentive structure in post-independence Nigeria was actually designed to favour import substitution. Fiscal, trade and exchange rate policies signal the government's support for import substitution manufacturing. Thus, most of the foreign investments in the sector were either assembly plants or for the production of import substitutes. However, as studies have shown, the efficiency of export promotion industries is much higher than that of import substitution industries (Ahluwalia, 1991; Adenikinju and Chete, 1995).

(b5) The Financial System

Financial capital is another form of capital, which, in addition to both physical and human capital, has an impact on productivity. Financial capital oils the wheels of productivity. Firm need it in order to acquire and effectively engage all the other productive inputs. Its importance in the overall productivity scheme can therefore not be overemphasized. Shortage of working capital can create major frictions in the production process and affects the productivity of other inputs as well as the overall total factor productivity. The Nigerian financial market is generally regarded as weak, inefficient, non-competitive, segmented, fragmentary, and dualistic[6] (Adenikinju and Oyeranti, 1999). Although there are 89 banks in Nigeria as at June 2004, many of these banks are undercapitalized. The ten largest banks account for half of the industry's total assets and liabilities. Capitalization of a majority of the Nigerian banks is less than US$10 million (Usman, 2005). The undercapitalization of most Nigerian banks has many consequences: first, it hampers the ability of the banks to support large transactions, such as financing infrastructural facilities etc, and, secondly, the banks cannot meet the needs of the real sector that requires large sums of investible funds, thereby stifling economic growth while promoting a culture of import dependence.

However, the Nigerian real sector depends heavily on the banking sector in spite of its weaknesses. Given the weak capital market, this implies that the capital structure of the firms is dominated by short-term denominated bank debts. The implication of this is that firms are not likely to commit to long-term investment. Secondly, high interest rates in the banking sector will have a significant impact on profitability as well as on firms' investment programs. The limited number of instruments available on the capital market means that firms are constrained in their financing options which limit their overall efficiency. Firms need working capital to survive and to expand their operations. Bankruptcy will result if they cannot have access to adequate working capital. The loss in capital and labour productivity as a result of firm failures will also affect productivity. Shortages of working capital constrain the capacity-utilization rate and lower both labour productivity and TFP.

As we previously noted there are two sources of financial capital: internal and external financing. Internal financing is through retained earnings (profits) while external financing comes from a number of sources: debt, equity, and grants and subsidies from government (Connolly, 2004). The literature is unambiguous on which of the two – internal or external financing – is expected to have the greater impact on productivity. Internal financing is generally believed to have a greater positive impact (repetition) because retained earnings can usually be used more quickly and readily to improve productivity. However, external finance serves as an agent of restraint and can usually force management to pursue productivity-enhancing goals. Table 2.12 shows that internal financing is a small, though growing, proportion of financial capital among Nigerian quoted companies.

In Nigeria, in spite of their predominance, the small and micro firms are completely left out of the formal credit channel and have to depend on the informal credit sources, with

[6] The Nigerian banks are weak because they are highly undercapitalized, poorly managed and depend heavily on government funds and foreign exchange transactions for survival.

their relatively high cost. This has limited scope for fresh investment among the small and micro firms. The spread in the lending and deposit rate is a manifestation of the difficult credit environment for the private sector. Add to this the preference of the formal credit sector for government lending and we see the difficult environment in which the productive sectors of the economy have to operate.

(c) The Deeper Level

Two major determinants of productivity in Nigeria are grouped under this broad heading: integration into the world economy and institutions. Both factors are quite important for productivity in the country. While on most indicators Nigeria can be said to be an open economy, at least on the trade side, the quality of domestic institutions is very weak and has undermined the beneficial impacts of trade openness and other macroeconomic reforms on the overall economy growth as well as on productivity. In effect, institutional reforms in Nigeria lag behind the economic reforms that the government has undertaken.

(c1) Integration into the World Economy

Integration into the world economy is very important for productivity. A country's openness to the global economy permits easy transmission of technology and advanced knowledge from world technology leaders. Several studies have confirmed the linkage between openness to trade and productivity growth. Madded and Savage (1998) (cited in Connolly, 2004) report that "both openness to trade and international competitiveness are shown to be significant short-run sources of Australian labour productivity performance". Cameron et al (1997) find that the rate of productivity convergence is primarily affected by international openness. Adenikinju and Chete (2000) show that indicators of trade openness, such as average tariff rate, effective rate of protection, share of foreigners in a sector, and prevalence of non-tariff barriers have a significant impact on productivity performance in Nigeria.

Nigeria can be classified as open, especially on the trade side, but not on the financial side. A measure of openness can be gleaned from the extent of foreigners' involvement in the Nigerian economy. According to Adenikinju and Ayonrinde (2001) more than a quarter of the shares in Nigerian quoted companies are owned by foreigners. This compares quite well with 5.4 percent in the USA, 4.0 percent in Japan, 14.0 percent in Germany and 6.1 percent in China (Yu and Wang 1997). Table 2.18 shows the ownership structure of Nigerian quoted firms. However, the very low share of foreign individuals in the shareholding structure is a reflection of the weak property environment. In a very weak property environment, like Nigeria, institutions are better able to protect their property rights than are individuals.

Table 2.18: Ownership Structure of Nigerian Quoted Companies, 1995-1998 Average

Ownership Type	Percentage
Domestic Institution	17.31
Foreign Institution	26.42
Domestic Individual	37.37
Foreign Individual	1.51
Government	7.76
Management	9.36
Staff	0.34
Concentration ratio (CR)	63.45

Source: Adenikinju and Ayonrinde (2001)

Table 2.19 also confirms Nigeria's relatively high degree of openness. Nigeria performed better than the average SSA country and also compared very well with the East Asian countries on most indicators of trade openness.

Table 2.19: Measures of Trade Openness in Nigeria and Selected Regions

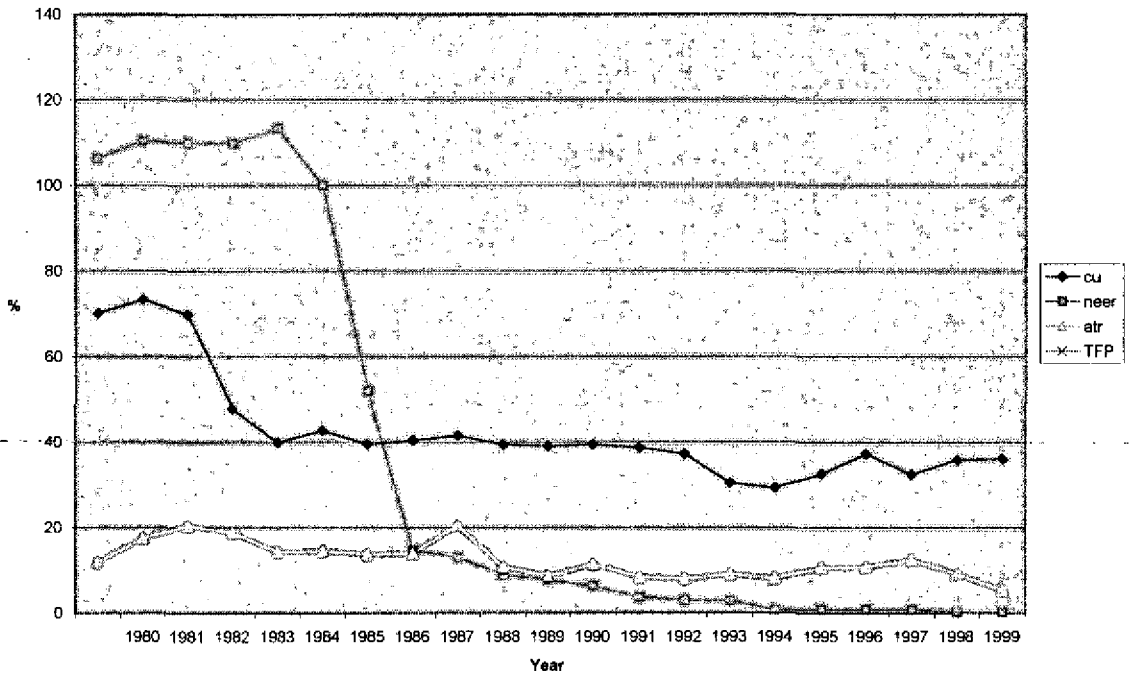
Year	Nigeria		SSA		East Asia	
	1989	1999	1989	1999	1989	1999
1. Trade in goods						
a. % of PPP GDP	21.3	20.5	15.9	16.3	14.5	15.3
b. % of Goods GDP	79.6	83.2	78.1	95.6	82.7	91.1
2. Growth in real trade less growth ('89-99)	2.2					
3. Gross private capital flows (% of PPP GDP)	3.5	4.3	2.1	4.9	1.3	3.8
4. Gross foreign direct investment (% of GDP)	2.8	1.0	0.6	0.7	0.4	1.1

Source: World Bank (2001) World Development Indicators

However, we must acknowledge that the influence of the oil sector has weighed very heavily on the trade openness indicators. The very restrictive trade policy practices in respect of the manufacturing sector hinder the sector's integration with the rest of the world. In the pre-1986 period, trade policy orientation was overwhelmingly protective. Tariffs and non-tariff barriers (NTBs) were extensively used. In spite of the change in trade policy orientation in the post-1986 period, the Nigerian firms have still not been successful in making the transition from focusing on the domestic market to being export market oriented.

Figure 2.4 also shows a weak transmission of trade openness indicators to total factor productivity in Nigeria. There is at best a very weak correlation between average tariff rates, the nominal effective exchange rate, and total factor productivity. In fact, the low capacity utilization in the industrial sector seems to have had a more direct impact on the trend in productivity compared to tariff and exchange rates. The exact impact of depreciation in the naira on economic performance has remained an important subject of debate in the country. While some argue that the significant depreciation of the local currency in the past two decades has worsened the country's economic problems, there are those that argue that the impact of the depreciation on the economy has been eroded by the rising domestic inflation rate.

Figure 2.4 Transmission of trade openness indicators to total factor productivity in Nigeria



Other factors are also responsible for the failure of the trade policy regime to stimulate productivity growth. The government's export incentives scheme suffered from a number of limitations that precluded a number of firms from benefiting from the scheme. For instance, the total sums disbursed under the program have been relatively small. The average refund per beneficiary under the Duty Drawback Refund (DDR) between 1988 and 1998 was a mere N2.8 million. The corresponding value under the Export Expansion Grant (EEG) was even lower at N1.4 million. Poor funding hindered the implementation of the scheme. For instance, of the N750 million requested by the NEPC, only N5.8 million was approved in 1996 and N8.2 million in 1998.

The issue of quality is also another constraint. For a very long time the country has not given serious consideration to the quality of local products. Domestic producers,

operating for many years behind a protective shield, did not give due attention to quality and even now their capability to respond to the new demand is highly limited, thereby affecting their ability to penetrate the OECD market. However, the challenge here is that raising the quality of Nigerian products would involve a significant addition to costs and technical capacity. In an empirical study on the determinants of export behaviour among Nigerian manufacturers, Bankole (2002) finds that the probability of exporting increases with exchange rate depreciation, access to market information and upgrading product quality. Three other variables – access to export credits, access to export incentives and firms' experience in exporting _ are not important determinants of export behaviour. The study findings show that upgrading the quality of products generally raises the variable costs of production. The estimated coefficient is 0.232, implying that the quality elasticity of variable costs is positive.

(c2) Institutions

Institutions play a role similar to infrastructure in productivity enhancement. The stability and predictability of Nigeria's institutional framework remains a major concern. Perhaps the greatest threat to Nigerian macroeconomic policy is the weak international confidence it has generated. Both private domestic and foreign investors perceive a high risk in the country because of poor contract enforcement, and the limited effectiveness of the judicial systems and other public services. Nigeria attracts very poor ratings from international credit ratings agencies (Ajayi and Adenikinju, 2004).

One of the fallouts from the oil boom is the growth in corruption and rent seeking. Rent seeking activities fueled by public sector dominance of the economy seem to attract resources away from productive economic activities. In Nigeria there is considerable weakness of civil institutions. Table 2.8 above shows that the country ranked very poorly on all the indicators of institutional infrastructure. Nigeria's corruption index of 1.6 was the worst among the 23 countries included in the table. Its score on the civil liberties scale was only surpassed by those of China and Vietnam. In addition, Nigeria had the worst score, -1.13, in the rule-of-law index. All of these indicators are hardly suggestive of an environment conducive to private sector growth.

The weak institutions have increased the cost of doing business for Nigerian firms and thereby lowered the profits available to be made by businesses and firms. The UNIDO/CSAE survey established that firms often have to make unofficial payments to ensure a steady supply of public services. This is particularly so in respect of public service connections, licensing and permit processing, government contracts and customs. Respondents also consistently rank the quality, integrity and efficiency of most public institutions as very poor.

According to the 2003 Index of Economic Freedom, published by the Heritage Foundation, Nigeria, with an average score of 3.60, is ranked 125th out of 155 countries on the scale of economic freedom. This puts the country among those classified as "mostly unfree". On individual components, Nigeria's trade policy was classified as being characterized by a very high level of protection. Property rights were scored 4 because of the low level of protection. Similarly, the country's regulatory system was

rated poor because, "The problem regarding Nigeria's regulatory system is lax and uneven enforcement".[7]

Table 2.20 compares Nigeria's ranking on the Index of Economic Freedom with the USA, South Africa and South Korea. Nigeria ranked 140th in 2003 compared to the USA which was 6th, South Africa 44th and South Korea 52nd. A high value in the index in any of the factors of economic freedom is suggestive of poor performance. Nigeria's trade regime, monetary policy, property rights, banking and finance and regulations were the worst of the four countries.

Table 2.20: Index of Economic Freedom Ranking, 2003

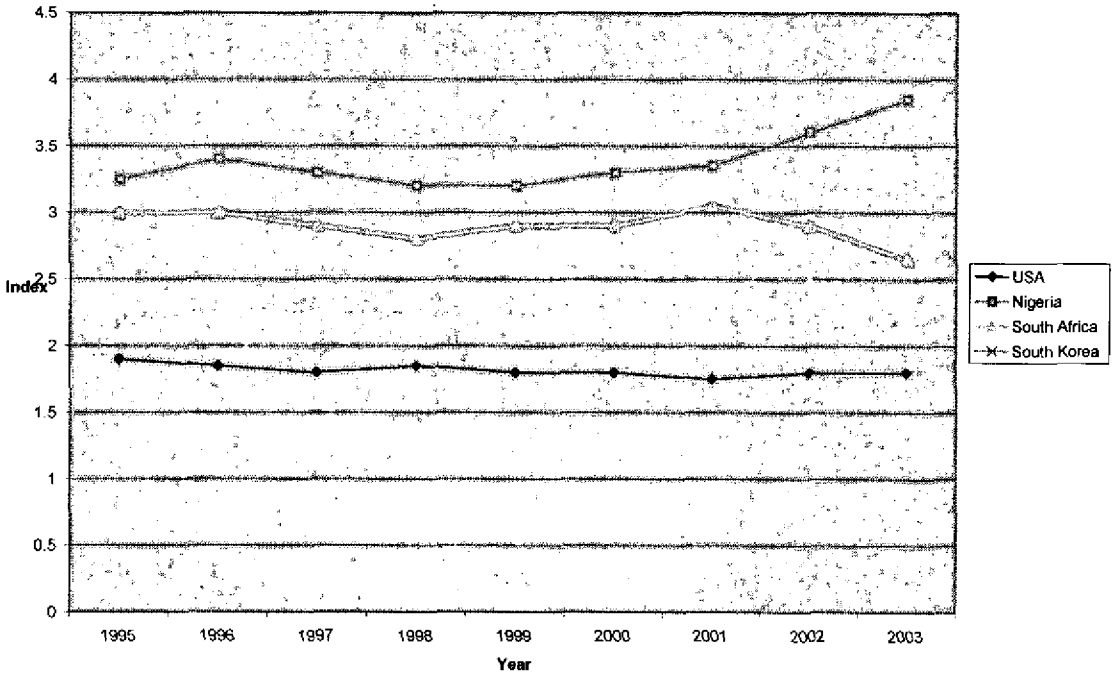
Factors of Economic Freedom	USA	Nigeria	South Africa	S. Korea
Trade	2	5	3	3
Fiscal Burden of Government	3.5	3.5	4.5	3
Government Intervention	2	3	2	4
Monetary Policy	1	4	2	2
Foreign Investment	2	3	2	2
Banking and Finance	1	4	2	3
Wage and Prices	2	3	2	2
Property Rights	1	4	3	2
Regulations	2	4	3	3
Black Market	1	5	3	3
Overall ranking on IEF	6th	140th	44th	52nd

Source: Heritage Foundation (2003)

Figure 2.5 gives the trend perspective to the indicators of economic freedom. For the period for which data were available, Nigeria consistently performs worse than the other three countries – the US, South Africa and South Korea. In addition, there seems to be a worsening of economic freedom and a divergence between Nigeria and the USA on the index over the period of time.

[7] US Department of State cited in the 2003 Index of Economic Freedom. Published by The Heritage Foundation.

Figure 2.5: Trends in Index of Economic Freedom 1995-2003.



D. Factors that also Matter

Economic agents operate in a macro-economy and they respond to the various incentives and signals that are generated through the government's macroeconomic policies; hence, the major factor that we identify under this heading which has had a significant impact on the course of the productivity trend in Nigeria is the unfavourable macroeconomic environment.

(D1) Macroeconomic Environment

Business investment and operations are best conducted in an environment of stability with a minimum level of uncertainty. The Nigerian macroeconomic environment is highly volatile and characterized by uncertainties. Policy reversals and policy changes are frequent. Capacity utilization and the quality of the social and economic infrastructure have declined significantly since 1980, whereas energy costs, telecommunication costs and nominal exchange rates have risen considerably. The seemingly hostile environment altered the preferences of economic agents towards short-term investments rather than longer-term more risky investments, and from high productivity-growth sectors like manufacturing to low productivity-growth sectors such as trade, distribution and land speculation. According to the United States ambassador to Nigeria, Mr. Howard Jefer, American investors shy away from Nigeria because "The regular trading environment is not stable". In the words of the ambassador, "You may have a tariff this month and in six months time it would be different. The tax regime is also unstable". Other problem areas

identified by the ambassador include safety and security. He noted that the "environment for safety and security did not exist".

Figure 2.6 presents the trend in indicators of macroeconomic environment in Nigeria between 1980 and 1999.

Domestic agents have had to operate under a very unstable macroeconomic environment where policy changes are frequent and often unpredictable. The incentive structure has also been biased against the real productive sector. The macroeconomic environment in the 1970s and early 80s was generally more conducive to private sector growth. Lending and inflation rates were lower than those that obtained in the post 1980s when inflation and lending rates rose sharply. Persistent inflation is harmful to the economy. Inflation has been a major problem in the Nigerian economy. Government fiscal policies and accommodating monetary policies coupled with a persistent decline in the exchange rate have persistently put pressures on prices. The high rate of inflation with a low nominal deposit rate translates into negative real deposit rates. This has continued to discourage savings in the economy (see Figure 2.6).

Figure 2.6: Trends in Indicators of Macroeconomic Environment

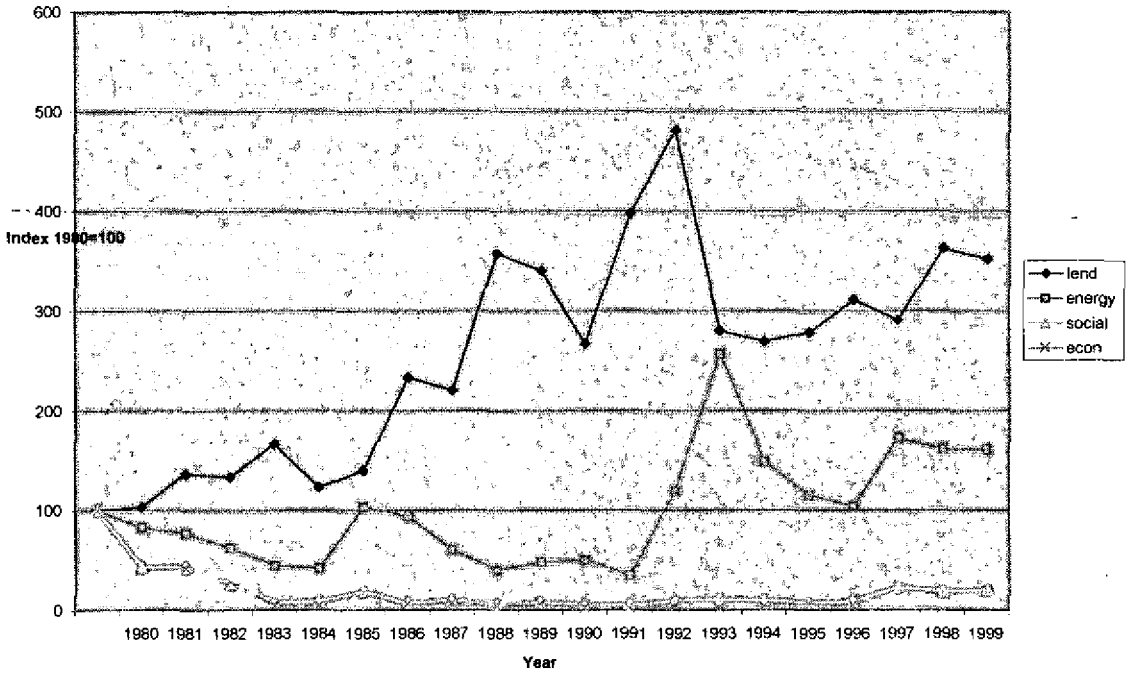
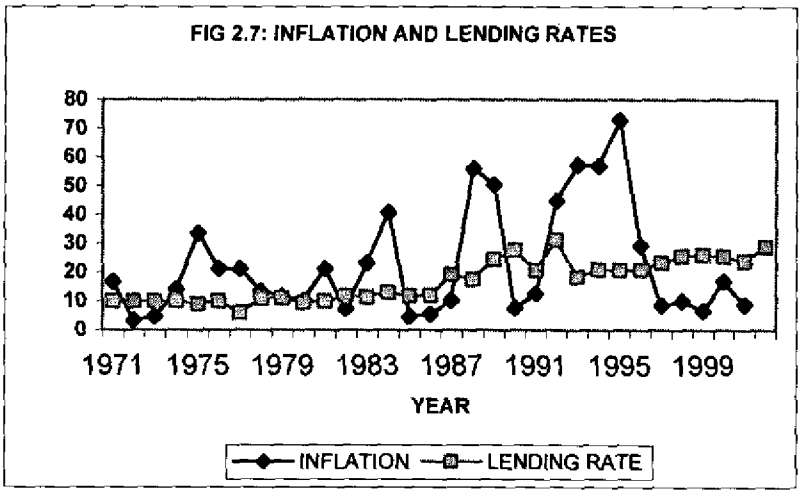


Figure 2.7 Inlation and lending rates



Persistent inflation results in currency substitution from the naira to an international currency and a flight of savings out of the country. Firms are reluctant to borrow because of the fear of the pressure of inflation on the lending rate. The higher risk of failures during inflation also reduces the incentives for banks to lend to the real sector. Banks will generally prefer to invest in assets with short-term maturities such as government treasury bills, imports and direct lending to the government.

The Nigerian corporate sector, including the financial sector, is highly concentrated. Adenikinju and Chete (1999) estimated a model linking productivity growth with trade liberalization and market structure. The coefficients of the two market structure indices – price-cost margin (PCM) and the Herfindahl index (CR_4) – show a positive and significant impact on productivity. This could be explained by the fact that the higher profits made by firms are being reinvested into the business. It could also be indicative of learning-by-doing at the firm level. Still, it may simply reflect the feature of the Nigerian economy, which has been aptly characterized as a seller's market.

Similarly, the study obtained a non-linear and statistically significant relationship between TFP and the square of the concentration index. This implies that, as concentration deepens at the industry level, productivity exhibits a U-shape, that is, productivity diminishes at first and later accelerates. This is possibly a consequence of the fact that most industries in Nigeria are dominated by a few conglomerates or multinationals that possess the financial clout to acquire foreign technology and utilize superior marketing strategies and are thus able to exploit the advantages of the economies of scale.

(e) Other Factors Affecting Productivity

The various reform policies implemented in the country have focused primarily on improving the price competitiveness of the economy. However, for the Nigerian economy

to be competitive, price competitiveness is just one of the important considerations. The most successful enterprises are those that can innovate and produce new products and can penetrate foreign markets. But the ability of domestic enterprises to penetrate foreign markets is not just a function of price competitiveness, which SAP has focused upon, but also non-price competitiveness like timeliness, quality, marketing and distribution skills, reliability, after-sales services, technological innovation and the institutional structural environment (Agenor, 1995). The exchange rate reform, though has led to a sharp depreciation of the real exchange rate, has, for the reasons mentioned above, not succeeded in switching production in favour of foreign markets rather than the domestic market and has thus not contributed to enhanced productivity growth of the Nigerian economy.

The competitive environment needs to be significantly improved in order to facilitate market access and prevent price distortions. Lagos Port is regarded as one of the slowest ports in the world with an average clearing time of33 days compared to the world average of 2 days, and the structural bottlenecks – lack of roads, electricity, water supply, etc – impede the growth of the private sector.

Another factor which is also important here is the macroeconomic volatilities in the Nigerian economy. Table 2.21 shows the volatilities of key economic variables in Nigeria and other selected countries. It is obvious from the table that volatilities in general are higher in emerging market economies than in the developed countries. Even among the emerging market economies, Nigeria has one of the highest rates of volatilities, especially in respect of inflation and exchange rates. Output volatility is however comparatively lower in Nigeria than most of these countries.

Table 2.21: Volatility and Average of Selected Variables for 1997 Q1-2002 Q2

	Volatility of Basic Variables			*Average*		
	Inflation	Exchange Rate [1]	GDP Growth [2]	Interest Rate	GDP Growth	Inflation
Developed Economies						
Australia	2.05	0.07	1.31	0.58	3.85	2.34
Canada	0.83	0.04	0.93	1.14	3.82	1.88
Iceland	2.45	0.15	3.13	3.02	4.17	4.05
New Zealand	1.21	0.08	2.25	1.47	2.83	1.62
Norway	0.77	0.10	2.25	1.46	2.66	2.44
Sweden	1.11	0.12	2.41	0.44	2.58	1.24
Switzerland	0.54	0.08	1.14	0.92	1.79	0.85
United Kingdom	0.92	0.06	1.45	1.13	2.70	2.45
Average	1.24	0.09	1.86	1.27	3.05	2.11
Median	1.02	0.08	1.85	1.14	2.77	2.11
Emerging Market Economies						
Brazil	2.11	0.23	2.06	7.06	1.83	5.99
Chile	1.30	0.06	3.14	2.32	3.12	4.21
Colombia	5.43	0.25	3.30	10.02	0.81	12.51
Czech Republic	3.46	0.09	2.73	5.81	1.18	5.31
Hungary	4.09	0.16	-	1.13	-	11.21
Israel	3.18	0.10	3.36	3.34	2.98	4.35
Nigeria	6.49	0.31	0.58	3.45	3.28	10.71
Mexico	5.98	0.07	3.17	7.26	4.05	11.72
Peru	3.04	0.11	3.45	5.50	2.11	3.89
Poland	4.13	0.11	2.40	4.14	3.85	8.40
South Africa	2.14	0.15	1.12	3.65	2.40	6.39
South Korea	2.36	0.14	6.38	5.52	4.31	2.88
Thailand	3.25	0.14	6.13	6.72	0.08	2.88
Average	3.61	0.14	3.15	5.07	2.50	7.02
Median	3.25	0.13	3.16	5.50	2.69	5.99

[1] Units of US$ to domestic currency.
[2] Std. Dev. of growth in GDP at constant prices (1995Q1=100)
Source: Batini(2004)

What volatility does is to increase the environmental risks that business faces. For instance, high and volatile inflation and lending rates are likely to lower output and productivity, other things being equal, by affecting the expectations of businesses about future credit and demand conditions and by reducing the amount of money that consumers have available for spending (Connolly, et al 2004).

Ranking of the Determinants and Conclusion

What all of the above discussion has shown is that not one single factor is responsible for the low and volatile performance of TFP in Nigeria. Several factors contribute. These factors are also interlinked. The last section of this chapter therefore provides us with the opportunity to rank all of the above determinants in terms of their relative importance in improving the productivity of the economy and also with regard to the effectiveness of policy to address them.

While the ranking is subjective, however, the various scores were derived from the following factors:

(1) Several previous empirical studies in these areas in the country.

(2) My own perception of the seriousness of the problem and the seriousness of the existing policy efforts to redress it.

The weight for each heading is based on the unweighted average of the score for each factor under the heading. In order words, we treat each of the factors as equally important.

Table 2.22: Ranking of the Determinants of Productivity in Nigeria

Determinant	Score	Rank
A. The Fruits of Knowledge: Creation, transmission and absorption of technology	**0.82**	**1**
A1. Research & Development	0.84	
A2. Technology Transfers	0.80	
A3. Adoption of New technology	0.85	
A4. Information Communication and Technology	0.80	
B. The Results of Accumulation	**0.73**	**2**
B1. Human Capital	0.78	
B2. Primary Inputs	0.70	
B3. Infrastructure	0.88	
B4. Structural Change of Production	0.65	
B5. The Financial System	0.66	
C. The Deeper Level	**0.60**	**4**
C1. Integration into the World Economy	0.50	
C2. Institution	0.70	
D. Factors that also Matter	**0.70**	**3**
D1. Macroeconomic Environment	0.70	
E. Other Factors Affecting Productivity	**0.50**	**5**

** The figures are normalized to a scale of zero to 1, where zero means that the factor is not very important and a score of 1 means that the factor is very important.

Although we have tried to rank the factors in order of their importance, we hasten to mention that for Nigeria to achieve long-term productivity growth it must perform well in all the factors.

However, while there are emerging efforts to improve the macroeconomic environment for private sector development in recent years, much needs to be done in the area of technology and infrastructure provision. Technology must be given priority of place in order to be able to affect the long-run trend in productivity in Nigeria.

III. Discussion of policies with effect on productivity

3.1 Introduction

In this chapter we identify some of the important policies that have impacted or will likely affect the long-run productivity trend in Nigeria. The government has realized, though belatedly, the illusion of oil wealth and that the best legacy that can be derived from oil is to use the ample financial resources it provides to restructure the economy and enhance its productivity growth. This is because productivity growth is the ultimate determinant of welfare in the long run. The late realization of this important linkage between productivity growth and welfare may have been responsible for what can be regarded as policy errors of the past. Public policy focus had over-concentrated on capital accumulation to the neglect of technical change and technical efficiency. This has undermined the contributions of the manufacturing sector and increased the pro-cyclical role of oil in the Nigerian economy.

However, in examining the policies that impact on the productivity trend in Nigeria, it is important to know that, while some policies have a direct impact on productivity, others have an indirect impact. Since we identify the macroeconomic environment as an important determinant of productivity, it also follows that policy changes that improve the macroeconomic environment will be quite relevant in our discussions here.

The various policies will be discussed under three broad headings:

(a) Policies that impact directly on productivity (narrow sense):
(b) Policies that promote economic performance and growth in general with implications for TFP change (broad sense);
(c) Other policies that have consequences on productivity developments (the broadest sense).

3.2 Policies that Impact Directly on Productivity

In the previous chapter we identify technological obsolescence and a weak technological base as perhaps the most limiting factor on technical change in Nigeria. Policy focus in the past tried to make up for this through the massive importation of technology and the attempt to develop a local capital goods sector. However, inadequate investment in basic industrial research, a lack of serious commitment to establishing research and development laboratories, weak linkages among the government, the private sector and the universities for the purpose of exploiting research findings, as well as a declining standard of education and skills acquisition, did not provide the needed platform for the imported technology to be domesticated.

Science and Technology and ICT Policies

In spite of its importance in coordinating the technological development of the country, a full-fledged Ministry of Science and Technology was not established in Nigeria until the early 1980s. Before then, the national government interacted with the nation's scientific community through a coordinating agency. Although there has been an increase in budgetary allocation for scientific research, which rose from the equivalent of US$11.5 million in 1988 to US$38 million in 2002, total budgetary allocation to the sector remains low as only 1.2 percent of the budget was allocated to science and technology in the 2002 budget. Until the establishment of the Science and Technology Ministry, there was no coherent national policy on science and technology (S &T) with broad goals, objectives and strategies spelt out in explicit terms. In spite of its expressed aims and principles, S&T policies seldom attract a high premium in government policies.

There are reasons to be hopeful, however. In September, Nigeria launched its first observational satellite used for remote sensing. Plans are also underway to launch a communication satellite in 2006 that will substantially increase access to electronic communications. This will facilitate a public-private sector investment strategy and impact on productivity. The President in 2002 set up a five-person Presidential Advisory Council on Science and Technology, the first in Africa. The Nigerian government also granted US$5 million to the African Academy of Sciences' Endowment Fund in support of the regional programmes in scientific co-operation. This will hopefully facilitate R&D and innovation activities that could fast-track productivity growth in the country.

Realizing the importance of information and communication technology (ICT), the government established the National Communications Commission in 1992. It was charged with responsibility for ensuring the provision of an adequate, effective and efficient telecommunication system. In addition, the government adopted a National Telecommunication Policy whose aim is to 'achieve the modernization and rapid expansion of the telecommunications network and services'. Recent deregulation of the telecommunication sector has led to greater private sector participation in telecommunication services delivery, and precipitated what is often regarded as one of the fastest growth rates in GSM mobile telecommunications in the world.

However, the route to this point has been quite long and arduous. For over three decades after independence market access was denied to the private sector in the provision of major telecommunication services. Public monopoly of telecommunication provision led to inefficiency, and unreliability of supply. The private sector bore the huge cost of this inefficiency. The recent deregulation notwithstanding, the internet connectivity rate is still very low and costly. There is also a huge divide between the rich and the poor and between rural and urban areas. This inequality extends to telephones and computer access. Apart from low teledensity in Nigeria, there is also inequality in its distribution. Using the availability of telephone lines as an index, the data revealed that 234,000 lines out of 400,000, or 58.5 percent, are located in Lagos alone. In respect of the level of internet connectivity, as at 1998, 38 internet service providers (ISPs) were registered but only 12 were active.

The government introduced computer literacy into the secondary school curriculum in 1988 as part of the efforts to develop skills required for a computer-literate society. The governing authorities of the nation's universities and polytechnics, the National

Universities Council (NUC) and the National Board for Technical Education (NBTE) respectively, complemented the efforts of the government by introducing courses in computer literacy in the institutions under their control. These initiatives resulted in a rapid increase in the number of computers and trained personnel. However, it is estimated that computer access and use as at 1999 was confined to 0.64 percent of the population.

Educational, On-the- Job Training Policies and Productivity Institutions

The Nigerian government is conscious of the importance of continuous education on the productivity improvement of the economy; hence a number of public institutions, such as the National Productivity Centre and the National Manpower Board, among others that have productivity improvement as their primary mandate, were set up. The Productivity, Price and Income Board (PPIB) was set up in 1976 to ensure that demand for national minimum wage negotiation not only reflects increases in prices but also takes account of increases in worker productivity. It is doubtful, however, to what extent concerns for productivity have been factored into adjustments in the national minimum wage by the government. There is also a Ministry of Employment, Labour and Productivity whose responsibility it is to ensure promotion of employment generation and labour administration in Nigeria. Also to encourage healthy industrial relations, the Industrial Arbitration Panel (IAP), a department of the Ministry of Employment, Labour and Productivity settles disputes between professional unions and their employers. Once a dispute is referred to the IAP for settlement, all parties in the dispute must revert to status-quo ante and maintain the peace until a final pronouncement of 'award' is made by the IAP.

To complement the formal educational institutions, private and public sectors have established a number of training institutions. The training institutions of the government include the Administrative Staff College of Nigeria (ASCON); the Centre for Management Development (CMD); the Industrial Training Fund (ITF); the National Centre for Economic Management and Administration (NCEMA); the National Institute for Policy and Strategic Studies (NIPSS), etc. Each Ministry has also been directed to allocate 10 percent of its personnel budget for on the job training (Ayanwu, 2000). However, poor funding continues to plague the performance of these institutions.

The Nigerian educational policy was intended to encourage the development of science and technology through the 6-3-3-4 policy. In this system, the Nigerian educational system is divided into primary, junior secondary, senior secondary and higher education. Primary education is a 6-year school and children are expected to begin at the age of six years and finish at the age of 11.. This is followed by three years of junior secondary and a choice of general, science or vocational secondary school for another three years. At the top of the hierarchy is higher education. University admission was also designed to favour science courses. Admissions are to reflect 60 percent in favour of sciences and 40 percent for non-science courses. However, the implementation of the policy has fallen far short of expectations. In fact, the incentive structure in the economy favours humanities and arts rather than sciences and technology. In addition, universities have grown more rapidly both in terms of numbers of institutions and enrolment of students, compared to the polytechnics. This has implications for the development of technology in the country. Nigeria has tended to produce virtually two university graduates for one polytechnic graduate, leading to what is called an inverted pyramid. Ideally, in order to ensure an

appropriate skills and job match, Nigeria ought to produce three polytechnic graduates for every university graduate (Ayanwu, 2000).
The incursion of oil changed the nature of the private-public sector mix in educational provision in Nigeria. Although educational provision started as a private sector affair, the petrol dollars brought about a radical change. The National Policy on Education was adopted in 1978 and revised in 1981. The 1981 document formalized the centralization of education in the country and declared that "education in Nigeria is no more a private enterprise but a huge government venture that has witnessed a progressive evolution of the government's complete and dynamic intervention and active participation" (FGN, 1981).

The oil shocks and the debt crisis in the eighties and the consequent adoption of SAP in 1986 affected the financing of education by the government. Educational expenditure dropped sharply, teachers' salaries were often delayed, increasing number of days were lost to teacher strikes, and teacher commitments suffered. All of these significantly affected the quality of public schools (Olaniyan, Adenikinju and Adedeji 2004). This led to a resurgence of private schools, whose proportion rose from 3.8 percent in 1980 to 10.6 percent in 2002. According to CBN, in 2001 there were officially 49,343 primary schools, 8275 secondary schools and 142 tertiary educational institutions (CBN, 2002). However, given the number of many unregistered private institutions, these figures are understated.

The increasing importance of private sector involvement in educational provision now extends to all levels of education in Nigeria, but it is more pronounced in the primary and pre-primary levels[8]. In a comprehensive study of primary schools in Lagos State in 2003 and 2004, Olaniyan, Adenikinju and Adedeji (2004) found that government schools only account for about 23 percent of private primary schools in Lagos compared to 34 percent and 43.3 percent of private registered and private unregistered schools respectively. The evidence of differences in the quality of public and private schools was also found in their study. The student-teacher ratio in government schools was 25:1 while the student-classroom ratio was 34:1. The comparative figures for private registered school were 16:1 and 17:1 respectively and those of unregistered private schools also 16:1 and 17:1 respectively (Olaniyan et al 2004). In addition, there were sharp differences in computer availability between public and private schools. Only 3.9 percent of government primary schools had computers compared to 73 percent and 41 percent for private registered and private unregistered primary schools respectively.

The relatively low quality of education in the public schools is also reflected in students' performance. Using pupil scores in the Raven Test, and tests on English language, mathematics and social studies, Olaniyan, Adenikinju and Adedeji (2004) obtain the following results:

[8] Policy is also changing in respect of private sector participation in the provision of higher education in the country. The university establishment is no longer the exclusive preserve of the government. In the past decades, many private organizations have been granted licenses to establish and operate universities.

Table 3.1: Pupil Scores in the Tests by School Recognition Type

Recognition Status of School	Pupil Scores			
	Ravens (60 marks)	Mathematics (20 marks)	English (20 marks)	Social Studies (15 marks)
Government	15.6	8.3	8.5	8.9
Registered Private	22.3	12.2	14.5	11.5
Unregistered Private	20.3	11.1	12.8	10.6
Total	19.4	10.5	11.9	10.3

Source: Olaniyan, Adenikinju and Adedeji (2004)

What the above table shows is the relative effectiveness of private schools. However, on average, the students in both private and public primary schools performed poorly in the Raven test, though the failure is more significant in government-owned schools. The shift in policies to encourage private sector involvement in educational provision is therefore a very good decision that could reverse the negative trend in educational standards in Nigeria. However, there is still a lot to do to improve the state of the infrastructure in the school system. Akinkugbe (1994) on primary schools in Nigeria reports that 77 percent of pupils had no textbooks at all while 30 percent had no writing materials, and 4.9 percent of the schools had no building. In addition, the most common instruction material is chalkboard and, incidentally, 3 percent have no chalkboard. The study further reveals that there was a 62.5 percent shortfall of teachers' and pupils' furniture.

The above shows that the existing educational policies are insufficient to redress the falling educational standard in the country and thereby provide the right quality of human capital and labour inputs needed for enhancing productivity in the economy.

Trade Liberalization Policy and Technological Development

The government's trade liberalization policies were designed to play an important role in the technological decisions of firms. Trade liberalization policies such as lower tariffs, increased access to foreign exchange and raw materials, and increased competition engendered by trade liberalization are supposed to increase the tempo of technological development in domestic enterprises and thus enhance productivity. However, Ayonrinde, Adenikinju and Adenikinju (1998) reported that this policy did not achieve its stated objectives. Only 15 percent of the respondents agreed that trade reforms led to an increase in the use of foreign consultants, 12 percent agreed that trade reforms led to an increase in licensing and 33 percent agreed that trade reforms led to an increase on capital equipment imports. . Econometric estimation shows that tariff did not have a statistically significant impact on technological acquisition. Size was the only significant determinant of technological acquisition. One possible explanation for the insignificant impact of tariff on technological activities is the contravening impact of higher input costs arising from the depreciating naira. The results also show that large firms were more inclined to invest in new technologies than their small-scale counterparts. UNIDO/CSAE (2002) shows that Nigerian enterprises' decision to export was strongly related to firm size. All

of these points suggest that policies to promote firm size will be a step in the right direction in promoting firm-level and economy-wide productivity.

Policies Addressing Standards, Quality and Intellectual Property Rights

To improve on product quality is one of the most important criteria for firms to undertake productivity-improving measures. Gonzalez and Pazo (2004) showed that the microeconomic determinants for firms to embark on R&D depend on the price-cost margins, the elasticity of demand with respect to quality and the elasticity of quality with respect to R&D (i.e., technological opportunities). In recent years, the government has turned its attention to addressing the issue of product quality and standards. This is going on at two levels. First, attempts are being made to improve the quality of Nigerian products and, secondly, importation of sub-standard goods from abroad is being discouraged and penalized. These efforts are likely to impact on firms' and businesses' competitiveness. Nigeria is a signatory to the Cartagena Protocol on Biosafety. Nigerian rules concerning sanitary and phytosanitary standards, testing and labeling are relatively well defined, and consistent with international standards. Regardless of origin, all food, drugs, cosmetic and pesticide imports are expected to be accompanied by certificates of analysis from manufacturers and appropriate national authorities, and specified animal products, plants, seeds and soils must be accompanied by proper inspection certificates.
The two foremost organizations in charge of standards and quality in Nigeria are the Standard Organization of Nigeria (SON) and the National Agency on Food and Drug Administration (NAFDAC). Both organizations were set up to monitor the quality and safety of goods produced or sold on the Nigerian market. The manufacturing, sale, export and advertising of all chemicals, in particular pesticides and pharmaceuticals, must be registered with NAFDAC. In order to promote standards, the Government has enhanced financial allocation to these two agencies that are directly responsible for monitoring standards in Nigeria, SON and NAFDAC (see Table 3.2).

Table 3.2: Recurrent and Capital Expenditure of SON (1992-1997)

Year	Recurrent expenditure (N'million)	Trend (1992=100)	Capital Expenditure (N' million)	Trend (1992=100)
1992	10.6	100	6.7	100
1993	12.5	118	8	119
1994	20	160	7	124
1997	37.6	355	183	2731

Source: Bankole 2002

While both NAFDAC and SON had made some efforts, especially in recent years, to ensure goods produced within or imported into the country meet acceptable standards, the two organizations are hampered by a lack of funds and technical capacity. Moreover, disputes among Nigerian agencies over the interpretation of regulations often cause delays and slow the movement of goods through Nigerian ports. There is a need for the government to empower NAFDAC and SON through increased funding and capacity building to enable them to meet the objectives for which they were established (Bankole and Olayiwola 2001).

Nigeria still has a long way to go in standards and quality. For instance, with regard to ISO 9000 certificates which provide some indicators of product quality in the

manufacturing sector and are a vital component of export requirements, Nigeria, as at 1999, has only 20 of these certificates compared to 3316 granted to South Africa. In respect of ISO 14000 Certificates, which are primarily concerned with how the country eliminates the harmful effects of production activities on the environment, the country has none compared to 82 in South Africa. Nigerian producers also seem to be conscious of the need to improve quality to enhance their overall competitiveness. This is evident in the UNIDO/CSAE study that shows that only 36 and 18 percent of the firms surveyed said that they produced better quality goods than other African and intercontinental competitors, respectively.

On the intellectual property front, Nigeria is a member of the World Intellectual Property Rights Organization (WIPO) and a signatory to the Universal Copyright Convention (UCC), the Berne Convention, and the Paris Convention. Nigeria's current IPR law affords protection that complies with most WTO provisions. In spite of these measures, piracy is rampant. Counterfeit pharmaceuticals, business and entertainment software, music and video recordings and other consumer goods are sold openly throughout the country. The Nigerian government's lack of institutional capacity to address IPR issues is a major constraint to enforcement. Relevant Nigerian institutions suffer from low morale, poor training and limited resources, and fraudulent alteration of IPR documentation is common. Patent and trademark enforcement remains weak, and judicial procedures are slow and subject to corruption. Companies rarely seek trademark or patent protection because they generally perceive Nigerian enforcement institutions as ineffective (source). This weakens firms' incentives to invest in R&D and other innovation activities since it is widely believed that the presence of strong intellectual property rights spurs innovation leading to higher economic growth.

3.3 Policies that Promote Economic Performance and Growth in General (Broad sense)

There are a number of policies that have an indirect impact on the productivity trend in Nigeria. We shall examine some of these policies in this section.

Trade, Exchange Rate and Industrial Policies

Trade policy affects the incentive structures facing domestic producers. Nigeria's trade policy over the years has had a significant impact on the structure of its economy and on the manufacturing sector in particular. Trade policy has fluctuated between protectionism and liberalism. In the pre-SAP era, trade policy was overwhelmingly protective. Tariff and non-tariff barriers and exchange restrictions were extensively used to protect domestic manufacturers against foreign competition. Tariff rates as high as 150 percent were imposed on some manufactured products. The protection objective of tariff supersedes its revenue generation objective[9]. Technology acquisition during this period was based on technology imports. However, the deliberate policy of an overvalued exchange rate and protective tariff created weak and sleepy firms that were unwilling to compete and innovate. The inherent weakness of the strategy of depending only on technology imports without developing a domestic technology capacity became obvious at the onset of the economic recession in the early 1980s. The quantitative restrictions

[9] Tariffs provide the Nigerian government with its second largest source of revenue after oil exports.

placed on imports by the government to manage the economic crisis led to a near collapse of the manufacturing sector as firms closed down and capacity utilization dropped precipitously. Furthermore, the overvalued exchange rate did not allow domestic prices of imported inputs to reflect their true cost, leading to more intensive use of these inputs in production processes and therefore increasing the dependence of the sector on imports.

In the post-adjustment period, trade policy has deemphasized protection and import substitution and now favours export promotion. Adenikinju (2003) clearly shows that although the country still has one of the highest tariff rates in West Africa, compared to its past tariff peaks, high tariffs and tariff escalations have reduced significantly. To allow for certainty in tariff regimes, the country implemented two seven-year tariff structures in 1988-1994 and 1995-2001. Nigeria's adoption of trade liberalization has led to a significant fall in import tariff. Incidences of high tariffs, tariff escalation and tariff peaks have also declined.

The data presented in Table 3.3 conveys the broad conclusion that tariff rates declined over the 1988 – 2001 period. The simple average tariff fell by 18 percent for all goods, 29 percent for consumer goods, almost 41 percent for intermediate inputs, and 6 percent in the case of capital goods. This pattern of liberalisation also implies a reduction of tariff rate variation across product groups.

Table 3.3: Trends in Tariff Rates, 1988 – 2001

	1988	1990	1995	2001
(i) All Goods				
Average	33.6	35.7	24.4	27.5
Range	0-115	0-200	0-150	0-100
(ii) Consumer Goods				
Average	53.5	55.2	38.6	38.1
(iii) Intermediate Inputs				
Average	26.2	31.2	21.1	25.2
(iv) Capital Goods				
Average	17.1	17.1	11.3	16.1

Source: Oyejide et al (2003)

The combination of trade and exchange rate policies also has an impact on the composition of imports. Foreign trade is a carrier of knowledge. Keller (1998 cited in Mayer 2001) argues that a country that is more open to machinery and equipments imports derives a larger benefit from R&D. He shows empirically that countries that have experienced faster growth in TFP have imported more from the world technological leaders. However, the share of machinery imports from developed countries in Nigeria's GDP was a mere 2.3 percent in the period 1970-79 and rose to 4.0 percent during 1990-98. These figures compared poorly with Singapore with a share of 15.3 and 15.8 percent of machinery imports from developed countries in its GDP over the two periods (Mayer, 2001). Table 3.4 also shows the shift in the composition of imports from capital goods and raw materials to consumer goods. This does not bode well for TFP growth.

Table 3.4: Trends in Import Composition by Major Groups (% Share in Total Value of Imports)

Type of Import	1986	1990	1995	1999	2001
1. Consumer Goods	21.8	26.7	33.1	39.99	38.80
a) Non-Durable Consumer Goods	18.2	23.5	30.0	36.40	35.60
b) Durable Consumer Goods	3.6	3.2	3.1	3.60	3.20
2. Capital Goods and Raw Materials	78.1	73.3	66.8	60.01	61.20
i) Capital Goods	36.2	40.5	21.5	23.00	21.10
ii) Raw Materials	41.9	32.8	45.3	37.01	40.10

Source: Central Bank of Nigeria, Annual Report and Statement of Accounts, various issues.

There has been a resurgence of import bans in recent years. The increasingly competitive environment is forcing the organized private sector (OPS) to mount pressure on the government to place bans on the imports of some goods. Many local firms have lost their market shares against cheaper and better quality imports and have begun to clamour for import bans. The government has acceded to some of the requests. However there are dangers ahead. First, the country has traveled this route before. Until 1986, Nigerian manufacturers enjoyed widespread protection from foreign imports. However, this opportunity between 1960 and 1985 was never translated into a strong and efficient domestic manufacturing sector. Rather, domestic producers became very weak, inefficient and uncompetitive.

Secondly, the government has to reconcile the interests of both producers and consumers. When there are import bans, producers gain while consumers lose. This is because, with import bans, the prices of local goods normally go up, leading to higher profits for producers of banned items and a welfare loss to consumers of those products as they have to pay more. The question is: What is the government going to do to ensure that the welfare of consumers is not compromised in the short-run?

Thirdly, the threat and the possibility of imports serve as an incentive for local producers to be more efficient in the use of inputs and their organization of production. Competition breeds efficiency. It is therefore very important that the government puts a definite time limit on the ban to compel the domestic producers to strive to compete at the expiration of the time period allowed. Imposing a time limit will serve as a motivation for domestic producers to develop their productive capacity and to eventually be able to compete with imports.

The failure of trade policy to stimulate productivity growth in the domestic economy also stems from problems related to policy credibility, frequent policy reversals, high policy mortality, weak institutional capacity, institutional inadequacy and poor institutional

infrastructure. Both the Federal Ministry of Finance and the Federal Ministry of Commerce have limited capacity in the formulation and implementation of trade and trade-related policy in Nigeria. The Department of Customs and Excise has complained about the lack of equipment, machinery and other relevant facilities as major impediments to their effective implementation of trade and trade-related policies (Alayande 2002).

Export Promotion Policies and Incentives

The government realizes the importance of exports in enhancing the productivity of domestic firms. One of the conclusions from the UNIDO/CSAE (2002) study on the Nigerian manufacturing sector is that there is a need to provide incentives for Nigerian firms to become more export-oriented because "microeconomic analysis of African firms' data indicates that those that do participate in the export market tend to improve productivity through a 'learning-by-exporting' process. Perhaps this is why the Nigerian government has designed a number of incentives to encourage export promotion. These include the establishment of the Nigerian Export Promotion Council (NEPC) in 1976, the Export Development Fund (EDF) to assist exporters to defray part of their export promotion costs, the Export Price Adjustment Scheme (EPAS) to compensate export producers who suffer a decline in export price on the world market, and the Export Expansion Grant (EEG) which encourages firms to be export oriented. Others include the abolition of export licensing, a Currency Retention Scheme (CRS) that allow exporters to retain 100 percent of their export proceeds in a foreign currency domiciliary account, and a Duty Draw Back Scheme (DDS) to refund customs duty paid on raw materials imported for the production of export goods. Additional measures include the Export Credit Guarantee and Insurance Scheme (ECGIS) and the granting of accelerated depreciation and capital allowance for firms that export their proceeds. In 1999, the government introduced the use of non-cash incentives to exporters by which their claims are credited against future imports. Under the new measure, existing schemes and funds were merged into a new Manufacturer-In-Bond Scheme (MIBS), under which payment of cash incentives to exporters would be replaced with a Negotiable Duty Credit Certificate (NDCS). This is expected to save the government from making a budgetary allocation each year and is in conformity with the WTO agreement.

Furthermore, two additional institutions were established – the Nigerian Export processing Zone Authority (NEPZA) and the Nigerian Export-Import Bank (NEXIM). The former was to oversee the implementation of the export-processing zone established in Calabar in 1991, while the NEXIM replaced the erstwhile Nigerian Export Guarantee and Insurance Corporation.

However, problems of poor funding of the schemes, inefficient implementation and corruption continued to hinder their success. Aside from these limited incentive programs, Nigeria's non-oil export sector does not receive subsidies or other significant support from the government.

Trade facilitation

Trade facilitation is critical to reducing transaction costs and enhancing efficiency. Export-orientation can be increased by designing measures to reduce the transaction costs faced by exporters and the long delays at clearing imports, which increase the costs faced

by domestic producers. Reducing the problems faced by users of Nigeria's ports has therefore been one of the major objectives of the government. Nigerian port users face inordinately long clearance procedures, high berthing and unloading costs, erratic application of customs regulations, and corruption. The Nigerian Customs Service (NCS) operates a pre-shipment inspection regime. The multiplicity of import documents and of agencies involved has been recognized as an unnecessary complication for importers. Several agencies operating at the ports also impede trade flows. It is estimated that illegal discharging levies increase the cost of imports by up to 45 percent. These problems have led to diversion of large volumes of trade to neighbouring ports.

Ports reforms were introduced in 1996 and 1999 to reduce the transaction costs and delay associated with imports and exports. The 1996 reforms include the expansion of mandatory inspection to cover all imports destined for Nigeria irrespective of value and the source of funding; the involvement of Professional Import Duty Administrators (PIDA) in the goods clearance machinery; and the rationalization of agencies at the ports. The government also re-introduced the 24-hour round the clock services at the ports. However, these efforts did not result in the clearance of goods from the ports within 48 hours as envisaged by the government.

In 1999, the government further reduced the number of agencies operating at the ports to six, namely, the Nigerian Ports Authority, the Nigerian Customs Services, authorized agents (authorized Inspection and Customs Agents), the Port Police, the Nigerian Immigration Service; and the PIDA – till the end of June 1999. Wherever the attention of specialized agencies (such as SSS, NDLEA, Plant Quarantine, etc) is required, they were to be called upon from their offices within the ports.

The port reform also involves the installation of high technology scanners at the ports to provide information on the nature, quantity and quality of imports. In addition, the government also commenced the implementation of the Automated System for Customs Data (ASYCUDA) in some of the ports. However, the implementation of these reforms has been very lax and has thus not produced any significant positive impact on trade facilitation.

Capital Market

Macro stability

The macroeconomic environment has a lot of influence on the level of domestic economic activities. As we indicated in the previous chapter, the Nigerian macroeconomic environment has been highly volatile, making investment decisions riskier than usual. Elements of the unfavourable macroeconomic environment include high inflation, high government debt, volatile export earnings, a weak financial system, and a high fiscal imbalance on the part of the government.

Since 1986 the government has embarked on bold economic reform programs that have aligned the exchange rate, interest rates and the domestic prices of energy goods closer to market values. Recent reforms of the banking system aim at making the sector stronger and more capable of supporting the real sector. These reforms have created an improved macroeconomic environment for doing business in Nigeria.

However, the capital market needs to be strengthened to complement the weak financial sector. The capital market is needed to provide long-term financing for the real sector. Investment in productivity-improving methods such as R&D, etc., require medium to long-term funds, not short-term funds. While the Nigerian Stock Exchange (NSE) was established by the Lagos Stock Exchange Act 1961, the growth of the Exchange was limited by the weak governance structure, lack of transparency and a combination of wrong government policies. The Indigenization Decree of 1972 and 1977, which seeks the Nigerianization of the economy, did much damage to the growth of the capital market as it stifles foreign investors' participation in the market and the economy.

However, a number of developments are altering the environment for the NSE. The abrogation of the Indigenization Decree and its replacement, first with the Nigerian Enterprises Promotion Decree of 1986, and then with the Nigerian Investment Promotion Commission (NIPC) Decree of 1995, and the Privatization and Commercialization Decree No. 25 of 1988, has all heightened activities on the capital market. In addition, the introduction of the Automated Trading System (ATS) in 1999 and the Central Securities Clearing System (CSCS) in 1997 has boosted the level of transparency and fairness that already exists in the stock market. The banking consolidation effort of the government has also raised the tempo of activities in the NSE. All of these would expand the opportunities available to the real sector to finance productivity-enhancing activities. However, many of the Nigerian firms are still too small to take advantage of the capital market.

The various macroeconomic reforms have not translated into a boom in economic and productivity growth because reforms in the institutional front lag far behind market-based reforms. Both market and institutional reforms are necessary for private agents as producers to contribute positively to economic growth. The economy is saddled with weak enforcement of contracts, poor security, and corrupt police and judicial officials, among other negative factors.

Infrastructure Policy

Given the important nexus between infrastructure and productivity, current policy reforms have shifted the frontiers of private sector involvement in the management and financing of the country's infrastructure sector. Nigerian and foreign investors are now operating in telecommunications, power, airways, and energy sectors, among others.

In respect of the road sector, one of the current initiatives to tackle the road problem is the commercialization of federal highways. The commercialization programme is to be carried out under twin concepts known as "build, operate and transfer" (BOT) and "rehabilitate/maintain, operate and transfer" (RMOT). As the names of the concepts imply, the private sector would have greater involvement in the process of the direct construction, maintenance and rehabilitation of federal roads. This implies a collaborative partnership between the public and private sectors in road development. It will also enable the government to benefit from the perceived higher management efficiency of the private sector. There is also an urgent need for an appropriate policy and political will to tackle the problems of the rail sector.

In the area of electricity supply in the past, the law setting up the National Electric Power Authority (NEPA) precluded private sector participation in all phases of electricity supply. Government investment in the sector was also disproportionately in favour of generation; hence, there was over investment in generation relative to distribution and transmission. Nigeria has one of the highest rates of distribution and transmission losses in the world. At its inception the Obasanjo government made electricity reforms part of its priority. The government set a target that the NEPA should generate and distribute 4,000 MW of power, though this was substantially lower than the over-39,000 MW generated and distributed by South Africa. Billions of naira was committed to achieving this goal. Large-scale importation of transformers was embarked upon to boost distribution, and power stations were refurbished. However, the structural bottlenecks in the sector were not addressed.

One of the panaceas recommended by experts and stakeholders to reform the electricity sector is a shift in the structure of electricity supply in Nigeria. The present structure is essentially public, inefficient and uncompetitive. Electricity reforms that allow for increased private participation in the funding and management of power utilities, and that allow for competition and an enhanced governance structure of the utilities board was deemed essential. The Electric Sector Reform Act is expected to bring about far-reaching reforms in the electricity sector. NEPA, now called the Power Holding Company of Nigeria, is to be unbundled to 18 separate companies to deal with generation, transmission and distribution.

Currently, government budgets have given primacy of place to the infrastructure sector. For instance, the 2001 budget has the following objectives:

- Restructuring of the Nigerian economy to make it market-oriented, private-sector-led and technology-driven;
- Reduction of employment and an increase in productivity, while maintaining stable prices and a stable exchange rate, and a healthy balance of payments;
- Improvements in power supply, telecommunications and transport
- Improvements in credit delivery and in the extension of services to small and medium-scale enterprises.

Table 3.5 shows that the allocation to the infrastructure sector under the budget was quite heartening.

Table 3.5: Approved Capital Expenditure for 2001

Power and steel	N69.8 billion	26 percent
Works and housing	N53 billion	20 percent
Water resources	N49.8 billion	19 percent
Education	N24.8 billion	9 percent
Health	N29.1 billion	11 percent
Transport	N23.0 billion	9 percent
Agriculture	N18.1 billion	7 percent

Source: Approved budget: 2001 Fiscal year.

However, the efficiency of these expenditures and the wide gap between the approval and implementation of budgets remain the major problems.

3.4 Other Policies with Consequences for Productivity Growth

Corporate Governance Policy

An increasingly significant positive linkage is being established between corporate governance and firm performance. The recent high profile corporate failures in the United States are generally agreed to have been accentuated by governance weakness. In addition, the limited foreign inflow of portfolio investment in Nigeria can be traced to fears about the corporate governance environment in the country. Gradually, some progress, albeit slowly, can be seen in the areas of improving the corporate governance structure in Nigeria. On April 2003, the Boards of the Security and Exchange Commission (SEC), in collaboration with the Corporate Affairs Commission (CAC), approved the recommendations of a 17-member Committee set up in June 15 2000 to bring the corporate governance structure in Nigeria in line with international practice. Key provisions of the new governance structure include increasing the role of non-executive directors, separating the positions of the chairman and the chief executive officer, full and clear disclosure of directors' total emoluments and those of the chairman and highest paid director, including pension contributions and stock options where the earnings are in excess of N500,000, and the protection of minority shareholders (Adenikinju, 2004). This will enhance the environment for private investment and operations in Nigeria.

Land Reforms

The Land Use Decree has been a major constraint to business investment in Nigeria. The decree, introduced in 1976, conferred land ownership on the state. However, there are a number of problems with the decree. First, the 'one man one plot' introduced by the decree was considered to have hindered mass housing. Secondly, the decree concentrated power in the hands of office holders, especially the governors who must issue a certificate of occupancy (C of O) and could withhold their assent or revoke a previously given C of O. Adding to the problem was the unusually long time needed for a certificate of occupancy to be approved by the government. The time cost and even the money spent to speed up the process have served as a disincentive to genuine investors. Recently, the President promised to pursue the amendment of the controversial Land Use Decree in order to ensure unfettered property development and the industrialization of the country. This will undoubtedly enhance the business environment in the country.

Anti-Corruption Policies

The country is also trying to tackle its image problem which has been a major constraint to non-oil FDI in the past. In the last few years, it has consistently been among the four most corrupt nations in the Corruption Index published by Transparency International. Corruption is one of the reasons why the cost of doing business in Nigeria is very high. Firms have to make unofficial payments to ensure a steady supply of public services. Mauro (1995) found a significant negative relationship between corruption and investment, as well as between corruption and economic growth. Tanzi and Davoodi (1997) also found that corruption is growth-retarding by reducing the productivity of public investments. Bahmani-Oskooee and Nasir (2002) showed that countries

experiencing high degrees of corruption tend to experience a real depreciation of their currency implying that they are less productive than less corrupt countries.

Tackling the problem of corruption has therefore been a cardinal objective of the Obasanjo government. The government has stopped the practice of denominating public contracts in dollars. Nigeria is also one of the first few countries to join the Transparency International in the extractive industry. A Department of Government Procurement known as the Due Process has been established to ensure that government agencies' procurements and contracts are not inflated. The government has also set up the Economic and Financial Crimes Commission (EFCC) to investigate and prosecute economic and financial crimes as well as an Independent Corrupt Practices Commission (ICPC) to investigate and prosecute all cases of corruption.

Public-Private Sector Cooperation

The current strong participation of the private sector in policy formulation in the industrial sector in Nigeria bodes well for the future of the sector. The Manufacturers' Association of Nigeria (MAN), the National Chamber of Commerce, Industry, Mining and Agriculture (NACCIMA) and the National Employers' Consultative Association (NECA) have in the past ten years or so been actively involved in providing input into government policies affecting the OPS. In addition, MAN has representation on all federal government committees that have to do with commerce and industry and even education. It is represented on important boards of government parastatals and other agencies such as the Nigerian Customs Board, the Nigerian Shippers Council, the Export Promotion Council, the Standard Organization of Nigeria, the Industrial Training Fund, the Nigerian Export-Import Bank (NEXIM), the Utilities Charges Commission, the Tariff Review Board. The Association also has seats on the governing boards of some federal polytechnics, the National Advisory Council for Cooperative Developments and the Nigerian Society of Engineers as well as the Council of Registered Engineers (COREN). Through these fora and the Annual Pre-Budget Memoranda to the government on matters of interests to manufacturers, as well as representation in inter-ministerial bodies, MAN has been able to influence policy at the formative stages, and in some cases even at the implementation stage.

3.5 Constraints to Productivity Growth in Nigeria

From our discussions thus far it is very clear that there are a number of constraints to productivity growth in Nigeria. Amongst the most important of these are the following:

First, there is the absence of a consistent and long-term strategy for productivity improvement. While the government has, over time, seen the need to improve the productivity levels of the economy through some of the institutions it has created, like the National Productivity Center, Productivity Day, and the National Manpower Board, among others, it is also obvious that these were half-hearted measures. These organizations were not well funded. The government failed to develop a consistent and long-term strategy for productivity growth. Neither has there been any attempt to integrate productivity considerations into the overall framework of economic policy. In

addition, there is still a lot to do in the generation of data on productivity. This has made it difficult to assess productivity performance in the country.

Secondly, there is the extensive dominance of the public sector in the economy. One of the fallouts from the oil boom was the government's decision to take over the commanding heights of the economy. At independence the Nigerian government inherited from the colonialists an economy in which the private sector was quite active and involved in very many sectors of the economy. The Third National Development Plan, which was developed during the oil boom, reversed this trend and substituted public dominance for private sector dominance of the economy. The inefficiency that characterized public sector operations soon spread through other sectors of the economy.

Thirdly, there are very weak corporate linkages among the various sectors of the economy. Business linkages facilitate innovation, higher productivity through specialization and flexibility in meeting customers needs, and enable economies of scale. Developing corporate linkages between small and large firms, and between foreign and domestic firms was one of the industrial development strategies that was widely used by the East Asian countries. The UNIDO/CSAE (2001) study found that only 30 percent of firms they surveyed admitted to having alliances with other firms. They also found that more large firms were involved in alliances than small firms.

Fourth is the weak linkage between the educational system and the requirements of the economy. Apart from the obvious fact of the declining trend in educational quality in Nigeria, there are other problems that have made the huge government investments in education not fully useful to the economy. First, the educational attributes are not always congruous to labour market requirements and, secondly, the education system is not adapting to the dynamics of the labour market. Thus, the researches that are carried out at the universities are hardly congruent with the market needs. This mismatch between the needs of the labour markets and the output of our educational institutions has led to huge unemployment of graduates resulting in a huge waste of human resources. It is estimated by the National Manpower Board (NMB) that the open unemployment rate in Nigeria in 1998 stood at 17.6 percent. The huge problems of graduate unemployment and fiscal federalism coupled with years of military mismanagement have weakened the climate for investment in the country.

Fifth is the poor functioning of the labour and capital markets. Adenikinju and Oyeranti (1999) show that the Nigerian factor market is both uncompetitive and inefficient. The factor market is dualistic and the labour market is also geographically segmented. This hinders the easy mobility of labour from one part of the country to another. The labour market is also inefficient in reconciling job offers with job seekers. The financial sector has also been quite unsupportive of the productive sector. High lending rates and the preference of the banks for government securities and the financing of distributive trade to the neglect of the manufacturing sector hinder the latter from being able to expand and invest in new technology.

In addition, productivity has been largely hindered by the inefficient state of the physical and social infrastructures. The reason why other policy measures such as trade and macroeconomic policies have not had the desired impact on manufacturing productivity is because of the high cost and poor quality of the available infrastructure. This negates other benefits from public policy and places the sector at a competitive disadvantage

relative to imports. Telecommunication cost in Nigeria is one of the highest in the world. The manufacturers also have to use inefficient roads as against the more efficient rail system in moving heavy inland goods across the country. The Economic Intelligent Unit (December, 2002), in a survey of formal private sector, noted that the Nigerian private sector suffers from high capitalization and operational costs. A comparative study of 24 African countries included in the Africa Competitiveness Report shows some striking results: Nigeria has the least satisfactory assessment in respect of roads, railways, ports and airports; the average customs clearance time reported by firms is 25 days, putting Nigeria 22ndout of 24 countries surveyed and in telecommunications, Nigeria is ranked 20th out of 24 African countries (22nd in internet access and 23rd in terms of telephone price). (African Competitiveness Report, 2000/2001, Centre for International Development and World Economic Forum, New York: Oxford University Press, 2000).

Government involvement in business R&D in the past was limited to tax incentives provided for R&D activities. Up to 120 percent of expenses on R&D is tax-deductible, provided they are connected with the business from which income or profit is derived. For the purpose of R&D on local raw materials, 140 percent of expenses is allowed. Where the research is long-term, it will be regarded as a capital expenditure and will be written off against profits. However, the government did not directly provide funds to support business R&D.

3.6 Possible Actions to Overcome Constraints to Productivity Growth in the Country

There are several actions that must be taken to address the constraints to productivity growth identified above. These include, first, making the financial sector highly responsive to the needs of the real sector for investment. This will require the following: integration of the financial system, strengthening corporate governance, ensuring competition in the sector, and ensuring sound banking supervision.

The labour market must be made more flexible. There is a need to provide information on jobs and skills so that the market can improve the match between demand and supply and enable labour to move to its most productive use in response to market signals. The educational and vocational training institutions must be responsive to the needs of the economy. Periodic curricular review to ensure feedback between the market and the educational institutions must be carried out. Wage legislation must be deregulated and wage negotiation should reflect both the cost of living and productivity factors with the latter given considerable weight.

In addition, researchers in the public, academic and private sectors must work together. The government must fund business-related researches and provide more direct support for innovation. The intellectual property environment, including copyright and patent, must be strengthened to encourage private initiatives.

Furthermore, there is a need to integrate both trade and industrial policies. Trade facilitation initiatives must be pursued. The government must invest in the expansion of trade and domestic infrastructures and build domestic capabilities in trade competition and for export diversification.

The government's current effort to improve the macroeconomic environment and to reorientate its budgetary allocation to favour the social and economic infrastructures is a step in the right direction. It must also continue to encourage private sector investment and participation in the financing and provision of infrastructures, as is the current trend all over the world. Data is a major obstacle to proper policy formulation and implementation; hence the government must fund data generation institutions in the country.

Recent government efforts to strengthen the private sector are moving in the right direction. The National Economic Empowerment and Development Strategy (NEEDS) document identifies four main priority areas for policy reforms: pursuing sound economic management, improving the condition of public infrastructure, diversifying the economy while emphasizing poverty reduction, and increasing integration with the regional and global economies. Regulatory barriers in most sectors are being removed, albeit slowly.

There is an urgent need to address the observed technological weaknesses in the country. There is limited R&D activity and the adoptive capacity of the country to absorb technological innovation is quite weak. The government must seek ways to redress this limitation. There are various channels through which it can achieve this goal.

It must support and carry out industrial R&D. The very few industry-related government R&D institutes like the Industrial Data Bank, the Raw Materials Research and Development Council (RMRDC), the Federal Institute of Industrial Research (FIIRO) and the Product Development Agency (PRODA) have suffered from poor funding and lack of patronage from the industrial sector. The latter problem is due to its inability to effectively disseminate its findings as well as the limited relevance of its these findings to enhancing the competitive needs of the private sector. Related to this is that the capital goods sector is very weak; hence it becomes more difficult to translate product and process designs to final stage.

A corollary of the above is the need to strengthen existing feeble institutional linkages across business firms, technical departments of universities or polytechnics, and government research laboratories. There is no contracting of industrial research to technical institutes or technical departments of tertiary institutions.

Although, the present government has increased the salaries of university lecturers from about US$200 to US$1000 a month over the past four years, nevertheless, the it must complement the increase in pay with a better functioning of the educational institutions. It must invest in university infrastructure – buildings, equipment, laboratories and libraries and dormitories.

The government needs to formulate a formal competition policy in Nigeria. The on-going deregulation and privatization policies of the federal government are the two most important issues that have a great significance for competition. The government has established an Advisory and Regulatory Authority on competition to deal with all forms of anti-competition (practices, mergers and acquisitions in the conduct of business).

Areas of UNIDO support

UNIDO has contributed significantly to enhancing productivity growth as well as strengthening productivity institutions in Nigeria. Between 1983 and 2005, UNIDO spent over US$34.1 million to support 141 projects in the country. These projects cover diverse areas such as climate change, pollution abatement, food/chemical laboratory facilities, industrial governance focusing on public-primary partnerships and rural-private sector agro-industrial development. Others include providing assistance to the Industrial Data bank, the National Office of Industrial Property (NOIP) and support for the National Statistical Information System. Most recent UNIDO projects in Nigeria include providing support for establishing a UNIDO Regional Centre for Small Hydro Power in Abuja. Quite appropriately, UNIDO also supports an Industrial Policy Forum involving key stakeholders in the economy as well as sponsoring surveys of manufacturing firms.

Nevertheless, UNIDO should continue to support government agencies involved in data collection, processing and dissemination. There has not been much of this support in recent years. Absence of reliable, timely and comprehensive data continues to be a major constraint to policy formulation in Nigeria. The organization should also sponsor more productivity-profitability studies in key industrial sectors of the economy. UNIDO could also provide technical and possibly financial support for exporting firms and those that want to break into the export market.

UNIDO has provided technical assistance to the SON to strengthen its national capacities and technical testing facilities. This has led, among other outcomes, to the establishment of two laboratories for metal and building materials; training of assessors in quality assurance and ISO 9000; and the adoption of ISO 9000 as the national standard for Nigeria. In addition, 230,000 standards and specification were compiled for the information management centre which handles data on national and international standards. UNIDO can also extend the same technical assistance to NAFDAC.

In addition, UNIDO could assist in curriculum development and bridging the gap between educational and government research institutions on the one hand and the needs of the private sector and the economy on the other. UNIDO can sponsor periodic conferences that will allow for interaction between employers and educational authorities. The organization can also fund the dissemination of the research findings of the universities and research institutes and provide technical support for firms willing to commercialize these findings.

IV Concluding remarks

Productivity is vital to repositioning the Nigerian economy to compete in the globalizing world of the 21st Century. Competition in the globalized economy is dependent on a nation's productivity performance. Productivity is a major determinant of the long run growth trend of an economy as well as a major factor in poverty reduction.

Boosting the productivity of the Nigerian economy is therefore a major policy challenge. The policy makers will need to take a look at the various dimensions we have mentioned in this paper. The government has an important role to play in creating a conducive environment for productivity initiatives by the private economic agents. It must ensure the efficient and effective provision of public goods, support the provision of infrastructures, and address various forms of market failures. The reality of government finances in Nigeria today also demands the involvement of the private sector in infrastructure provision. The private sector can complement the public sector with the supply of finance and the provision of technical and managerial capacity for effective project implementation. However, the government must develop the institutional framework for ensuring an efficient private sector.

Any nation willing to make its mark in the 21st Century must give primacy of place to research and development as well as developing the absorptive capacity of its economy. Nigeria is currently weak in both areas. Policy efforts must reverse this trend. There must be government commitment to ensuring that the low productivity trend in Nigeria in the past forty-five years is reversed: with the nation's abundant human and natural resources, this can be done.

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