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**Jean Michel Marchat, John Nasir, Vijaya Ramachandran,
Manju Kedia Shah, Gerald Tyler, Lan Zhao**

**Regional Program on Enterprise Development
Africa Private Sector Group
The World Bank**

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1. Introduction

The Nigerian economy has performed poorly since the late 1970s, resulting in stagnation and increasing poverty. Gross national product (GNP) per capita in 1999 was US\$300, lower than the level attained during the first oil price boom. Over two-thirds of the population lives below the poverty line (equivalent to roughly one US dollar per day) compared to 46 percent in 1985. Social and economic conditions for most Nigerians have worsened dramatically despite the country's abundant natural resources. Life expectancy at birth is only 54 years; over one-third of Nigerians will not live to 40 years; the child mortality rate for those under age five is 187 per 1000; two-fifths of children under age five are undernourished; the proportion of under fives who are underweight is 36 percent; only 50 percent of the population has access to safe water; a similar share does not have access to basic health facilities; and two-fifths of those over 15 years of age are illiterate. The AIDS epidemic is worsening without an effective response at hand.

Nigeria is undergoing a very difficult political transition. The newly elected government has inherited an economy damaged by mismanagement, debilitated institutions of government, pervasive corruption, worsening poverty, and very high unemployment. The democratic transition, following the return to democracy after 15 years of military rule, has rekindled hope among all Nigerians, particularly among the 70 million who are below the poverty line.

To understand the Nigerian economy, it is necessary to separate it into two parts: the one directly involved in oil production and the remainder. These two economies are distinct and interact only in a few important ways. For the vast majority of Nigerians, the non-oil economy is the source of their income and what they consume, amounting to about \$190 per capita annually. The annual oil revenue gets divided among Nigerian workers; foreign workers and oil companies; reinvestment in the oil sector; and the revenues of the Federal Government of Nigeria (FGN). The oil revenues that reach the state treasuries provide the majority of resources for state and local governments.

Oil exports have led to prolonged Dutch Disease, creating a highly overvalued exchange rate, which has decreased profits in the tradable sectors of the non-oil economy. As a result, Nigeria's traditional agricultural and manufacturing export industries have been largely destroyed. The large flow of oil revenues has led directly to high levels of waste and corruption. Only a small percentage of oil revenues has ever used effectively for investment or poverty reduction. Becoming used to certain levels of expenditures, the FGN has resorted to substantial borrowing to maintain them when oil revenues fell. The critical economic challenge is accelerated growth in the non-oil sector. It did expand at around 6 percent per year during Nigeria's homegrown structural adjustment period (1985–1992), largely as a response to substantial liberalization. Today virtually every sector needs structural reform.

Economic Performance During the Nineties

Economic prospects and policy choices for the Nigerian economy are conditioned by its performance during the 1990s. Table 1.1 sets out macroeconomic indicators for this period.

Table 1.1: Macroeconomic Indicators

	1990-1999	1990-1994	1995-1999
Real Output Growth (% Change)			
Real GDP	3.4	4.0	2.8
Non-Oil GDP	3.8	4.4	3
Oil GDP	2.4	4.5	0
Money Supply Growth (% Change)			
M1	32.2	45.8	18.6
Inflation (% Change)			
Consumer Prices	30.6	35.8	25.4
Official Rate ₦/US\$	50.5	16.4	84.6
NEER Index (Trade Weighted) 1990=100	37.8	65.7	9.8
Interest Rates (% Per annum)			
<i>Commercial Banks Interest Rates</i>			
3 Months Commercial Bank Time Deposit Rate	15.4	19.1	11.7
Commercial Banks' Prime Lending Rate	22.6	26.6	19.5
Commercial Banks' Maximum Lending Rate	24.9	28.1	22.3
<i>Interest Rates on Government Securities</i>			
3 Months Treasury Bill Rate	16.0	18.7	13.3

Source: Averages are based on figures published in the *Annual Report* of the Central Bank of Nigeria, various years.

Annual real growth in gross domestic product (GDP) averaged 3.36 percent over the decade, inferring per capita growth of around 0.5 percent. In spite of the windfall arising from high oil prices at the start of the decade, the oil component of GDP actually declined annually at the rate of 0.6 percent. Growth of both oil and non-oil components was slower in the second half of the decade. In contrast, money supply (M1) and consumer price inflation increased annually at 32 and 30.6 percent, respectively.

This discouraging picture of “stagflation” is borne out in statistics on the expenditure components of Nigeria’s GDP in Table 1.2.

Table 1.2: Expenditure Performance in the 1990s (Annual Averages)

% Changes in Real Naira Value	1990-1999	1990-1994	1995-1999
Private Consumption	2.0	2.23	2
Government Consumption	21.7	34.7	11
Capital Formation	1.4	0.7	2
Exports	-2.3	-10.9	5
Imports	7.2	3.7	10

Source: Averages are based on figures published in the *Annual Report* of the Central Bank of Nigeria, various years.

Gross fixed capital formation and private consumption grew at only 1.4 and 2.0 percent annually, inferring an actual decline in per capita terms over the 1990s. In contrast, government consumption grew almost 22 percent annually over the decade, although its annual rate of increase was cut significantly from 35 to 11 percent during the latter half. While exports earnings, almost entirely reliant on earnings from oil, actually declined annually (in real terms) over the decade, imports continued to expand by almost 7 percent per year.

Trends in output of the principal sectors of the economy are presented in Table 1.3.

Table 1.3: Trends in Output (1990=100%)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Real GDP	100.0	104.8	107.8	110.2	112.0	115.6	118.9	122.7	125.6	128.9
Oil GDP	100.0	109.2	112.1	109.2	109.4	112.2	119.9	121.6	115.7	110.9
Non-Oil GDP	100.0	104.0	107.2	110.5	112.6	114.9	118.2	122.3	126.4	131.0
of which:										
Agriculture	100.0	103.5	105.6	107.1	109.7	113.7	118.3	123.3	128.3	133.6
Manufacturing	100.0	109.4	104.1	99.7	98.9	93.5	94.3	94.6	90.9	92.3
Crude Petroleum	100.0	109.2	112.1	109.2	109.4	112.2	119.9	121.6	115.7	110.9
Mining & Quarrying	100.0	100.0	103.7	111.1	114.8	114.8	118.5	125.9	133.3	137.0
Utilities	100.0	102.0	112.0	116.0	120.0	122.0	124.0	124.0	120.0	122.0
Building & Construction	100.0	104.0	108.1	113.3	116.8	119.7	121.4	128.9	136.4	142.2
Transport	100.0	103.5	108.1	113.0	113.0	114.4	116.5	120.0	124.2	127.7
Communication	100.0	92.3	103.8	107.7	107.7	111.5	115.4	123.1	130.8	142.3
Wholesale & Retail Trade	100.0	103.2	106.4	109.6	109.6	109.7	110.6	112.3	115.7	118.5
Hotels & Restaurant	100.0	100.0	102.1	104.2	104.2	106.3	108.3	110.4	114.6	118.8
Finance & Insurance	100.0	104.1	108.1	112.3	115.6	120.4	125.1	130.5	136.9	141.6
Real estate	100.0	100.0	103.8	107.7	111.5	115.4	119.2	123.1	130.8	134.6
Housing	100.0	103.8	108.2	112.5	115.9	119.7	120.7	128.8	136.5	141.3
Producers of Government Services	100.0	104.1	117.1	133.2	136.6	138.0	139.3	141.4	142.9	145.5
Comm. Soc. & Personnel Services	100.0	101.5	107.5	119.4	134.3	156.7	179.1	206.0	247.8	297.0

By the end of the decade, manufacturing output in real terms had actually dropped to about 92 percent of the level reached in 1990. Although the other productive sectors did register modest growth, it was more than offset—in terms of per capita output—by the annual increase in population. The one exception was agriculture. Not surprising, in light of the rapid increase in public sector consumption, the services sectors grew relatively faster.

There is little evidence, as indicated by the figures in Table 1.4, of any significant changes in the structure of output. In 1999 agriculture accounted for about 40 percent of GDP, virtually the same proportion as in 1990. The share of output originating in manufacturing declined slightly from 8 to 7 percent, somewhat less than that of producers of government services (9.5 percent).

Table 1.4: Structure of Output (% of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1990-94	1995-99	10-YR AV
Agriculture	39.0	38.6	38.3	37.9	38.2	38.7	39.0	39.4	40.1	40.6	38.40	39.56	38.98
of which:													
Crop Production	30.1	30.0	30.1	30.2	30.6	31.0	31.1	31.5	32.0	32.4	30.20	31.60	30.90
Livestock	5.7	5.4	5.3	5.2	5.2	5.3	5.2	5.2	5.2	5.2	5.36	5.22	5.29
Forestry	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.30	1.24	1.27
Fishing	1.9	1.9	1.6	1.2	1.1	1.2	1.4	1.5	1.7	1.9	1.54	1.54	1.54
Crude Oil	12.9	13.4	13.4	12.8	12.6	12.6	13.1	12.8	11.9	11.1	13.02	12.30	12.66
Mining & Quarrying	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.30	0.30	0.30
Manufacturing	8.1	8.5	7.9	7.4	7.2	6.6	6.5	6.3	5.9	5.9	7.82	6.24	7.03
Utilities	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.58	0.56	0.57
Building & Construction	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	1.94	2.04	1.99
Distribution	12.7	12.5	12.5	12.6	12.4	12.2	11.9	11.7	11.8	11.7	12.54	11.86	12.20
Transport	3.2	3.1	3.2	3.2	3.2	3.1	3.1	3.1	3.1	3.1	3.18	3.10	3.14
Communication	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.30	0.30	0.30
Hotels & Restaurant	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.50	0.50	0.50
Finance & Insurance	8.7	8.7	8.7	8.9	9.0	9.2	9.2	9.3	9.6	9.6	8.80	9.38	9.09
Real estate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.30	0.30	0.30
Housing	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.32	2.42	2.37
Producers of Government Services	8.4	8.4	9.1	10.2	10.2	10.1	9.9	9.7	9.6	9.5	9.26	9.76	9.51
Comm. Soc. & Personnel Services	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.7	0.76	1.32	1.04
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.00	100.00	100.00
Memo:													
Real Sector	70.1	70.4	70.3	69.9	69.9	70.0	70.4	70.4	69.8	69.9	70.12	70.10	70.11
Services Sector	29.9	29.6	29.7	30.1	30.1	30.0	29.6	29.6	30.2	30.1	29.88	29.90	29.89

As a share of GDP, the crude oil sector only accounted for 12.7 percent in 1999, virtually the same as nine years earlier (12.9 percent). However, Nigeria's continuing dependence on this sector is dramatically illustrated by the data on export earnings and government revenues in Tables 1.5 and 1.6. Oil continues to account for over 95 percent of export earnings and its share of government revenue actually rose slightly from 73 percent in 1990 to 76 percent by 1999. Over the decade, other revenues, which originated largely in the organized private sector, namely company tax, value-added tax, and customs and excise, grew in relative importance, although still accounting for a much smaller share.

Table 1.5: Structure of Exports (% of Total Exports)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1990-93	1994-98	9-YR AV
Agriculture	2.4	3.0	1.6	1.7	2.0	3.8	3.3	4.1	6.7	2.2	4.0	3.2
Crude Oil	97.0	96.2	98.0	97.7	97.5	95.6	96.5	95.6	93.2	97.2	95.7	96.4
Manufacturing	0.5	0.9	0.4	0.5	0.5	0.6	0.2	0.3	0.1	0.6	0.3	0.4
Total Exports	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 1.6: Structure of Government Revenue (as % of total revenue)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1990-94	1995-98	9-YR AV	
Oil Revenue		73.3	81.9	86.2	84.1	79.3	70.6	71.0	71.5	70.0	81.38	72.48	76.43
of which:													
Crude Oil Exports & Petroleum		73.3	81.9	86.2	84.1	79.3	53.2	51.1	49.1	36.5	81.38	53.84	66.08
Taxes													
AFEM Surplus		0.0	0.0	0.0	0.0	0.0	17.3	19.8	22.4	21.4	0.00	16.18	8.99
Draw-Down from Reserves		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.00	0.92	0.51
Non-Oil Revenue		26.7	18.1	13.8	15.9	20.7	29.4	29.0	28.5	37.5	18.63	29.02	24.40
of which:													
Companies Income Tax		3.1	3.8	2.8	5.0	6.1	4.8	4.2	4.5	7.2	3.68	5.36	4.61
Custom & Excise Duties		8.8	11.3	8.4	8.0	9.1	8.1	10.6	10.8	12.4	9.13	10.20	9.72
Value-added Tax (VAT)		0.0	0.0	0.0	0.0	3.6	4.5	6.0	5.8	8.0	0.00	5.58	3.10
Federal Government Independent Revenue		1.8	3.0	2.6	2.9	1.9	4.4	0.7	1.4	2.5	2.58	2.18	2.36
Others		13.1	0.0	0.0	0.0	0.0	7.6	7.6	5.9	7.5	3.28	5.72	4.63
Total Revenue		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.00	100.00	100.00

As a share of GDP, government revenues actually declined during this period, from around 38 to 25 percent. Most of this decline, as indicated in Table 1.7, resulted from the drop in oil revenues (in relation to GDP).

Table 1.7: Structure of Government Revenue (% of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1990-93	1994-98	9-YR AV
Oil Revenue	27.6	25.5	29.7	19.7	17.6	16.6	13.5	14.7	11.9	25.63	14.86	19.64
of which:												
Crude Oil Exports & Petroleum Taxes	27.6	25.5	29.7	19.7	17.6	12.5	9.7	10.1	6.2	25.63	11.22	17.62
AFEM Surplus	0.0	0.0	0.0	0.0	0.0	4.1	3.8	4.6	3.6	0.00	3.22	1.79
Draw-Down from Reserves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.00	0.16	0.09
Non-Oil Revenue	10.1	5.7	4.8	3.7	4.6	6.9	5.5	5.9	6.4	6.08	5.86	5.96
of which:												
Companies Income Tax	1.2	1.2	1.0	1.2	1.3	1.1	0.8	0.9	1.2	1.15	1.06	1.10
Custom & Excise Duties	3.3	3.5	2.9	1.9	2.0	1.9	2.0	2.2	2.1	2.90	2.04	2.42
Value-added Tax (VAT)	0.0	0.0	0.0	0.0	0.8	1.1	1.1	1.2	1.4	0.00	1.12	0.62
Federal Government Independent Revenue	0.7	0.9	0.9	0.7	0.4	1.0	0.1	0.3	0.4	0.80	0.44	0.60
Others	4.9	0.0	0.0	0.0	0.0	1.8	1.4	1.2	1.3	1.23	1.14	1.18
Total Revenue	37.6	31.2	34.5	23.5	22.2	23.5	19.0	20.6	17.0	31.70	20.46	25.46

A more comprehensive picture of the state of public finances over the 1990s, including the impact of its financing on the flow of financial resources to the private sector, is provided by the data in Table 1.8. Fiscal operating surpluses averaged 2.9 percent of GDP during the nineties. However, because of significant outlays to service public sector debts, fiscal *deficits* averaged almost 6 percent (in terms of GDP) during the decade. Their financing is reflected in the lion's share of domestic credit extended to the public sector throughout most of this period. In the second half, the situation began to improve insofar as domestic credit to the private sector grew more rapidly and the federal government's debt (as a percentage of GDP) began to decline.

Table 1.8: Summary of Fiscal Situation in the 1990s (Annual Averages)

	1990-1999	1990-1994	1995-1999
Fiscal Situation (% of GDP)			
Operating Fiscal Balance	2.9	-2.2	8.0
Overall Fiscal Balance	-6.0	-9.5	-2.4
Domestic Credit Outstanding (% of GDP)			
Domestic Credit to the Federal Government	12.4	19	6
Domestic Credit to the Private Sector	11.4	12	11
Domestic Credit (Public Sector % of Private)	111.1	161	61
Federal Government Debt (% of GDP)			
External ¹	64.2	92.5	35.9
Domestic	23.4	31.6	15.2

Source: Averages are based on figures published in the *Annual Report* of the Central Bank of Nigeria, various years.

¹ Like government revenue figures which are dominated by components denominated in US dollars, the external debt figures for much of the 1993–1998 period are most likely to be understated when expressed in Naira. The official exchange rate used by the government over those years overstated the value of the Naira relative to the true rate that have been used by private sector in estimating other components of the GDP.

Completing our overview of Nigeria's economic performance during the 1990s is information on its balance of payments contained in Table 1.9. The data highlight the net outflow of resources arising from the country's external debt.

Table 1.9: Trade and Payments Balances in the 1990s (as % of GDP)

	1990-1999	1990-1994	1995-1999
Merchandise Exports (F.O.B)	34.8	33.2	36.4
Merchandise Imports	-21.5	-19.1	-23.9
Merchandise Trade Balance	13.4	14.2	12.5
Services and Income Balance	-17.7	-17.3	-18.1
Net Transfers	2.7	1.9	3.4
Current Account Balance	-1.6	-1.2	-2.1
Capital Account Balance	-4.6	-5.5	-3.7
Errors and Omissions	-0.3	-0.3	-0.2
Overall Balance	-6.5	-7.1	-5.9

Source: Averages are based on figures published in the *Annual Report* of the Central Bank of Nigeria, various years.

Economic Stabilization and Policy Reform

The FGN has taken measures to rectify the imbalances resulting from mismanagement over the preceding decade, to spur growth through a revitalized private sector operating in an increasingly open and competitive economy. Taking office at the end of May 1999, the newly elected government has begun to address corruption and initiate a series of economic reforms. Excessive budgetary spending has been brought under control, especially by halting expenditure on large and wasteful projects. Monetary policy has featured implementation of temporary control measures to limit financial sector liquidity. Moves toward a fully market-determined exchange rate system were introduced in late October 1999. These measures, together with favorable weather conditions for agriculture, contributed to a sharp drop in inflation to 6.8 percent in 1999 along with a reduction in interest rates.

The year 2000 budget, featuring a prudent fiscal policy, has limited the overall deficit to 2.5 percent of GDP. Achieving an approved budget on this basis has been difficult. The National Assembly has been seeking to establish its role in the budget process under the new Constitution and have its priorities reflected in the budget, notably in capital estimates. An adversarial situation has delayed budget approval. In fact, the debate is symbolic of how much in Nigeria has changed. The arguments advanced by the executive and the legislators were deliberated in public and broadly reported in the press—a healthy development that would have never occurred under past military regimes. However, the FGN has been operating month by month at last year's provisioned level and has not been able to launch new programs. Uncertainty has also damaged business confidence.

The FGN is ready to undertake privatization in a major way and to focus the state's role more effectively on poverty reduction, service delivery, provision of public goods, strengthening the rule of law, and environmental improvement. It is working to achieve improved cooperation between the executive and legislative branches and to strengthen the judiciary.

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While the economic team at the Presidency, Federal Ministry of Finance (FMF), the National Planning Commission (NPC), and the Central Bank of Nigeria (CBN) has a good appreciation of the depth and breadth of the reform agenda, many line ministries and the National Assembly do not. After years of fluctuating revenue flows, departmental policy makers have found it difficult to channel resources to priority programs and focus on implementing them effectively. The FMF has had to fight the continued budget padding and incremental approach to budgeting. Project evaluation is rudimentary at best. Privatization is viewed in many quarters with a jaundiced eye. Corruption remains pervasive. Financial management and procurement systems do not work properly. The new government has inherited a civil service with very low morale, and the erosion of salaries and benefits has hampered attempts to recruit qualified and experienced people.

A major reconstruction and reform initiative has been launched in Nigeria since the transition to democratic government in May 1999. Excessive spending has been brought under control, especially by halting expenditure on large and wasteful projects. A special panel appointed by the president reviewed some 4,000 public contracts awarded previously and recommended cancellation of 1,700 of these (worth US\$1 billion) and renegotiation of the rest. In particular, all 31 oil exploration and production licenses issued from early 1999 have been withdrawn. The 1995 Anti-Money Laundering Decree has been ratified as an act under the Constitution. An independent audit of the operations of the CBN has been completed. A management audit of the Nigeria National Petroleum Corporation (NNPC) has been undertaken with assistance from the World Bank. Following a period of 12 years during which only scanty information about NNPC was made available, monthly publication of comprehensive data has been resumed. New emphasis in spending has been placed on Universal Basic Education (UBE), on expanding primary healthcare facilities throughout the country, on rural water development in small communities, and on a new poverty alleviation program in smallholder agriculture.

Resources that might have been allocated toward poverty alleviation must be expended on debt servicing, clearance of domestic arrears, wages, administration and overhead costs, and completion of a large number of National Priority Projects initiated in prior years. The way the budget is formulated and presented does not facilitate estimation of the likely impact of various programs on poverty. Despite some successes in donor-financed poverty alleviation programs, most FGN-financed poverty programs thus far have not been successful. Reasons for this failure include inadequate design, lack of continuity in government allocations, cumbersome disbursement mechanisms, excessive personnel and overhead costs, and duplication of effort among too many agencies.

The FGN has begun the complex process of reforming its budget process and reconstructing public finance systems. It has constituted a Budget System Review Committee to examine the budgetary process of the FGN from conceptualization to formulation and execution, addressing such issues as the better costing of projects, the role of the Rolling Plan, ministerial monitoring capacity, and the timetable for budget preparation and discussion with the National Assembly.

Medium-term macroeconomic prospects for Nigeria presume political stability, successful stabilization, Paris Club debt rescheduling, implementation of the policy agenda for private sector growth, and more effective public sector spending on social services and infrastructure. Real GDP growth was projected to reach 4.6 percent in 2002. Growth is expected to be broad based and derived from increases in agricultural productivity and private investments in manufacturing, mining, oil and gas, electrical power, telecommunications and services.

Despite favorable oil prices, Nigeria is currently poorly placed to use its resources effectively to accelerate growth and reduce poverty. Its oil revenues affect the economy through the intermediation of public expenditure. There is virtually no direct impact of oil revenues on the incomes or opportunities of the vast majority of Nigerians. Thus, oil revenues can only have a positive impact on growth and poverty reduction if they are used effectively by the FGN to provide critical economic and social services. For the last 30 years this has not been the case. Non-oil exports represent less than 5 percent of non-oil GDP, while non-oil imports amount to over 30 percent of non-oil GDP. This imbalance is largely due to an overvalued exchange rate associated with the decimation of Nigeria's traditional agricultural export industries—cocoa, palm oil, and groundnuts. The manufacturing sector is running at only 30 percent of capacity. Only as more competitive industries come on stream can Nigeria expect to experience the kind of growth that will reduce poverty. Diversification of Nigeria's export sector will take some time. Thus short- and medium-term economic prospects will necessarily depend on improved economic management, good governance, efficient and equitable use of public resources, and restoration of an enabling environment to attract private investment.

For the near term, export earnings will continue to rely on oil and gas. While much depends on prices, higher efficiency in oil extraction and expanded use of natural gas will also be important. Significant diversification of exports can only occur over the medium to long term. As Table 1.10 shows, the current account deficit is projected to average around 6.6 percent of GDP per annum during 2000–2002, depending on how much Nigeria actually pays in interest charges. Gross international reserves are projected to increase to a reasonably safe level of at least 5 months of imports in 2001–2002. Adherence to the FGN's fiscal and monetary targets should permit it to maintain a stable real exchange rate and thus help preserve external competitiveness.

Monetary policy in Nigeria has been quite conservative since the new government took power. The growth of M1 and M2 has been 1.1 and 2.2 percent respectively over the first quarter of calendar year 2000. Consequently inflation, as of March 31, had declined to a yearly rate of 2.8 percent. However, real interest rates remain quite high. The maximum lending rate was 28 percent and the spread between deposit and lending rates was 22.6 percentage points as of March 2000). Private investment in 1998, the last year for which there are data, declined to 1.1 percent of GDP. Much of it can be attributed to an uncertain economic and political environment as well as high real interest rates. Clearly reduction of federal government borrowing will help lower interest rates and encourage more private investment.

Table 1.10: Macroeconomic Framework, 1996–2002

	Actual		Prelim		Projected		
	1996	1997	1998	1999	2000	2001	2002
<i>Annual % change in:</i>							
Real GDP	4.3	2.7	1.8	0.8	3.4	3.3	4.6
Real Exports (fob)	7.7	9.9	-36.7	13.3	36.7	7.0	7.0
Consumer Prices (end-period)	14.3	10.2	11.9	6.8	6.8	6.0	6.0
<i>% of GDP:</i>							
Overall Fiscal Balance	5.0	1.1	-13.9	-8.1	-2.5	-1.6	-1.9
External Current Account Balance	-8.3	-9.1	-9.8	-12.3	-6.8	-6.5	-6.5
Gross International Reserves (months of imports)	3.7	5.9	6.8	4.1	4.3	5.0	5.0
External Public Debt	82.0	83.1	80.8	78.0	76.7	74.0	71.2
External Debt Service Ratio (%)	31.0	33.5	41.4	34.9	22.6	21.7	21.0

Source: Federal Government of Nigeria, IMF, and Bank staff projections.

The external debt situation of Nigeria remains difficult. As can be seen from Table 1.11, the largest requirement is debt service, most of which was slated to be rescheduled during calendar year 2000. At the end of 1999, debt arrears constituted more than US\$22 billion out of a total of more than \$28 billion debt (with an additional US\$6 billion that has been added by the Paris Club as interest charges and penalties to this total). For 2000 the external financing gap is substantial, about US\$25 billion, of which about US\$23 billion would need to be rescheduled, mostly with the Paris Club. External debt service payments of US\$1.9 billion were made in 1999, US\$0.4 billion more than the amount originally included in the budget.

Table 1.11: External Financing Requirements, 1998-2002 (in US\$ million)

	1998	1999	2000	2001	2002
<i>I. Requirements for external financing:</i>	34,475	37,211	43,667	19,883	20,814
1. Imports of Goods and Non-Factor Services	12,468	14,851	16,893	16,460	17,445
2. Total scheduled debt service Obligations before debt relief	4,234	4,107	3,153	3,056	3,058
a. Of which multilateral creditors	731	750	635	677	689
i. of which IBRD	522	556	402	321	302
ii. of which IDA	5	5	9	12	20
b. of which bilateral creditors	2,238	2,973	637	549	504
3. Stock of arrears from previous period after adjustment	17,605	20,487	22,516	0	0
4. Reserves build-up	-115	-2,280	1,077	338	281
5. Current transfer payments	28	28	28	29	30
<i>II. Resources</i>	13,532	14,498	18,683	18,380	19,111
1. Exports of Goods and services	10,536	11,660	15,238	14,346	14,681
2. Current transfer receipts	1,544	1,293	1,417	1,586	1,782
3. Donor Project financing	0	0	114	159	200
4. Direct foreign investment	1,220	1,469	1,514	1,889	2,048
5. Commercial Banks	0	0	400	400	400
6. Other capital flows & errors and omissions	233	76	0	0	0
<i>III. Financing Gap (I - II):</i>	20,687	22,694	24,984	1,503	1,703

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IV. Net Reduction in Debt Servicing:	0	0	22,516	0	0
i. of which arrears	0	0	22,516	0	0
1. Net reduction in debt service on official bilateral Non-concessional debt	0	0	22,410	0	0
Of which arrears	0	0	22,410	0	0
2. Net reduction in debt service on commercial debt	0	0	106	0	0
Of which arrears	.	.	106	.	.
V. Projected Support	200	178	2,418	627	0
1. Official Development Assistance (ODA) disbursements	114	113	225	325	0
i. IDA	114	113	100	200	0
ii. Other (African Development Bank)	0	0	125	125	0
2. Official non-concessional disbursements	86	65	768	302	0
i. IBRD	86	65	0	0	0
ii. IMF (Standby)	0	0	768	302	0
iii. Other (exceptional Paris Club)	0	0	1,425	0	0
VI. Arrears: total stock end period	20,487	22,516	0	0	0
New accumulation in current period (ex post)	2,882	2,089	0	0	0
VII. Residual financing gap (III—IV - V - VI):	0	0	50	876	1,703

For FY2000, the consolidated accounts of the FGN were estimated to show a deficit equal to 2.5 percent of GDP. It is the Government's intention to finance the deficit through domestic borrowing. The revenue side of the government's accounts is quite complicated. As presented in Table 1.12, large shares of the FGN's revenues are earmarked for special uses, including distribution to other levels of government. The FGN's resources are divided into three categories, each comprising about a third of the total, namely earmarked uses including debt service and flows back to the oil sector (33.7 percent); state and local government (34.8 percent); and federal government outlays (31.4 percent). The share going to state and local government is largely determined by the Constitution.

Table 1.12: Sources and Uses of Government Revenues, 2000

Sources	Billions of Naira	Percentage Share
Oil Revenues ¹	1,111.1	78.7
Customs and Excise Taxes	100.0	7.1
Companies Income Tax	60.0	4.2
Value-added Tax	60.7	4.3
Other Federal Revenues and Levies	25.2	2.9
State and Local Revenues	40.0	2.8
TOTAL	1,412.0	100.0
USES		
External Debt Service	142.5	10.1
Joint Venture Cash Calls	223.3	15.8
NNPC Priority Projects	37.1	2.6
Niger Delta Development ²	69.3	4.9
State and Local Governments	442.9	31.4
Federal Government	496.7	35.2
TOTAL	1,412.0	100.0

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USES

State and Local Government	443.1	n.a.
External debt Service	69.3	n.a.
Other first charges	142.5	n.a.
FGN recurrent budget	260.4	n.a.
FGN capital budget	n.a.	n.a.
Payment of domestic debt service and arrears	n.a.	n.a.
TOTAL	n.a.	n.a.

¹Includes 636.5 billion N from government crude account, 100 billion N in petroleum profits taxes, 124.7 billion N in royalties, 208.6 billion N from domestic crude operations, 21.3 billion N in other oil revenues and 20 billion N from upstream gas sales.

²This account represents an agreement to transfer 13% of the consolidated revenue accounts to the seven oil-producing states in the Niger Delta.

n.a. Not available.

Source: Draft Year 2000 Budget Estimates

The budget is based on an oil price of US\$20 per barrel. If the price exceeds US\$20, all the additional revenue is deposited in an “Excess Crude Account,” which is held at the Bank of International Settlements (BIS). These foreign resources are part of the CBN’s overall holdings of foreign exchange. They are not monetized (i.e., they are not converted into Nigerian naira), and they do not appear in the fiscal accounts, except as a special “Excess Crude Account.” Since these resources are sterilized, they never enter the Federation Account, and thus there is no legal obligation to distribute any of these funds to the state and local governments. Once an appropriation bill is passed and signed by the president and thus becomes law, there is no legal way for the resources in the crude account to be used without an agreed-upon supplementary special appropriation. As of end May 2000, the balance of the Excess Crude Account was US\$654 million.

2. Population of Manufacturing Firms and the RPED Sample

This section provides a picture of the RPED sample of formal manufacturing firms interviewed in March and April 2001 in Nigeria. This step is necessary to make any inference about the broader results of the survey. The sampling design strategy was one of a stratified random sample.

The first part details the design of the sample frame, while the second part presents the surveyed sample and assesses its representativeness.

The Formal Manufacturing Sector in Nigeria: Sampling Frame

Numerous sources (Nigeria Federal Office of Statistics 1999; EIU 2001a and b) point out that industry in Nigeria has traditionally been based on small-scale firms. Activity is concentrated on the major urban centers, with Lagos and the south-west of the country accounting for more than half of the total. Kano, Kaduna, and Ibadan all have sizeable manufacturing zones, while the oil industry has attracted investment at Port-Harcourt and Warri. The manufacturing sector as a whole remains small. It accounted for only 5.9 percent of GDP in 1999, although output in the sector rose by 3.9 percent in 1999. By the late 1990s, the formal manufacturing sector² in Nigeria comprised about 16,000 firms and employed roughly 300,000 to 350,000 workers, depending on the source of the data.

The sample frame of the survey was devised in three steps. First, a list of firms including 16,056 officially registered companies for 1996 was obtained from the Federal Office of Statistics.³ Second, this listing was carefully checked and 302 firms were removed in order to define a mother population of 15,754 manufacturing firms.⁴ Finally, as the purpose of the survey was to study specifically formal sector manufacturing of a significant size, an additional selection criterion was introduced. To obtain a good representativeness of the sample in terms of employment, a cutoff of 20 employees was used for the minimum firm size.

The remaining listing was then stratified across location and sectors. To reflect more adequately the geographical distribution of firms and keep a minimum size for each cluster, three regions were defined: the North region, the East region, and the Lagos and South region. Similarly, to obtain a correct activity distribution, nine broad sectors were defined: Chemicals and Paints, Food and Beverage Industry, Metal, Non-Metal, Paper/Printing and Publishing Industry, Pharmaceuticals, Plastics, Textile and Leather Industry, and Wood Industry.

These manipulations enabled the building of a sample frame of 1,853 formal manufacturing firms. The next two tables show the basic breakdown of the sample frame among regions, size, and sectors as of 1996. The importance of the Lagos and South region is immediately apparent (Table 2.1). This region concentrates about 44 percent of the registered firms and roughly 52 percent of the employment in the manufacturing sector. Based on the average number of employees per firm, the largest firms are also located in the area.

² The formal sector is defined as any manufacturing firm registered with the "National Directory of Establishments" published by the Federal Office of Statistics (FoS).

³ This listing provided the name, address, activity (4 digit ISIC code), the number of employees and state of activity of the firms.

⁴ Firms with activity not directly related to manufacturing were eliminated. Firms removed from the mother population included enterprises in the oil sector, associations, and trading companies.

Table 2.1: Distribution of Firms in the Sample Frame by Region and Sector

		East Region	Lagos and South Region	North Region	Total
Chemicals and paints	Number of firms	41	80	33	154
	Total employment	7 452	11 059	3 435	21 946
	Average nber of employees/firm	181.8	138.2	104.1	142.5
	Standard deviation nber of empl.	(404.9)	(333.0)	(103.3)	(321.1)
Food and beverage ind.	Number of firms	136	124	138	398
	Total employment	16 706	43 536	17 176	77 418
	Average nber of employees/firm	122.8	351.1	124.5	194.5
	Standard deviation nber of empl.	(264.7)	(790.4)	(320.8)	(513.8)
Metal	Number of firms	62	102	79	243
	Total employment	7 869	12 628	6 589	27 086
	Average nber of employees/firm	126.9	123.8	83.4	111.5
	Standard deviation nber of empl.	(341.3)	(189.0)	(151.1)	(228.1)
Non-metal	Number of firms	27	32	62	121
	Total employment	4 199	3 609	5 228	13 036
	Average nber of employees/firm	155.5	112.8	84.3	107.7
	Standard deviation nber of empl.	(373.9)	(144.7)	(187.4)	(233.1)
Paper, printing, publish. ind.	Number of firms	32	98	35	165
	Total employment	2 236	10 742	2 640	15 618
	Average nber of employees/firm	69.9	109.6	75.4	94.7
	Standard deviation nber of empl.	(88.4)	(206.6)	(75.3)	(168.0)
Pharmaceuticals	Number of firms	6	28	9	43
	Total employment	279	4 632	617	5 528
	Average nber of employees/firm	46.5	165.4	68.6	128.6
	Standard deviation nber of empl.	(16.3)	(220.9)	(49.0)	(185.7)
Plastic	Number of firms	40	74	52	166
	Total employment	5 008	16 981	6 068	28 057
	Average nber of employees/firm	125.2	229.5	116.7	169.0
	Standard deviation nber of empl.	(127.6)	(460.2)	(183.2)	(333.0)
Textile and leather ind.	Number of firms	88	155	109	352
	Total employment	4 882	22 580	29 807	57 269
	Average nber of employees/firm	55.5	145.7	273.5	162.7
	Standard deviation nber of empl.	(161.5)	(397.3)	(902.7)	(577.3)
Wood industry	Number of firms	41	132	38	211
	Total employment	1 264	8 872	2 659	12 795
	Average nber of employees/firm	30.8	67.2	70.0	60.6
	Standard deviation nber of empl.	(10.0)	(172.1)	(82.7)	(141.1)
Number of Firms		473	825	555	1 853
Total employment		49 895	134 639	74 219	258 753
Average nber of employees/firm		105.5	163.2	133.7	139.6
Standard deviation nber of empl.		255.5	420.2	448.4	394.9

Source: World Bank, RPED Nigeria, 2001.

The Lagos and south region is also prominent in most of the sectors. With respect to the number of registered firms in a given sector, food and beverage and non-metal sectors are the only ones in which it does not dominate. Moreover, as most of the firms in the area are larger in size compared to the other regions, this region also represents the largest share of sectoral employment, with the exception of the non-metal and textile and leather industries.

The Nigerian manufacturing sector has an uneven size distribution (Table 2.2). While most of the sector is made up of small-scale enterprises (about 60 percent of the firms have between 20 and 49 employees), these firms account for only 12 percent of employment. With a few exceptions,

firms with more than 500 employees provide the bulk of sectoral employment. As a whole, they account for 53 percent of total employment in manufacturing.

Table 2.2: Distribution of Firms in the Sample Frame by Size and Sector.

Sector		Size	20-49	50-99	100-199	200-499	500 +	Total
Chemicals and paints	Number of firms		82	31	21	12	8	154
	Total employment		2 409	2 104	2 726	3 569	11 138	21 946
	Average nber of employees/firm		29.4	67.9	129.8	297.4	1 392.3	142.5
	Standard deviation nber of empl.		(7.9)	(13.3)	(26.7)	(67.5)	(491.9)	(321.1)
Food and beverage ind.	Number of firms		218	60	40	48	32	398
	Total employment		6 034	3 792	5 574	14 570	47 448	77 418
	Average nber of employees/firm		27.7	63.2	139.4	303.5	1 482.8	194.5
	Standard deviation nber of empl.		(8.0)	(12.6)	(27.0)	(81.9)	(1 185.3)	(513.8)
Metal	Number of firms		142	42	27	19	13	243
	Total employment		3 979	2 832	3 753	5 413	11 109	27 086
	Average nber of employees/firm		28.0	67.4	139.0	284.9	854.5	111.5
	Standard deviation nber of empl.		(8.1)	(12.7)	(31.6)	(66.8)	(549.6)	(228.1)
Non-metal	Number of firms		78	14	12	13	4	121
	Total employment		2 066	883	1 670	3 760	4 657	13 036
	Average nber of employees/firm		26.5	63.1	139.2	289.2	1 164.3	107.7
	Standard deviation nber of empl.		(6.7)	(12.3)	(28.9)	(89.1)	(567.0)	(233.1)
Paper, printing, publish. ind.	Number of firms		94	36	17	12	6	165
	Total employment		2 800	2 355	2 098	3 454	4 911	15 618
	Average nber of employees/firm		29.8	65.4	123.4	287.8	818.5	94.7
	Standard deviation nber of empl.		(7.7)	(13.9)	(23.0)	(67.7)	(324.9)	(168.0)
Pharmaceuticals	Number of firms		17	13	5	5	3	43
	Total employment		542	828	663	1 476	2 019	5 528
	Average nber of employees/firm		31.9	63.7	132.6	295.2	673.0	128.6
	Standard deviation nber of empl.		(10.9)	(12.5)	(22.8)	(82.0)	(295.3)	(185.7)
Plastic	Number of firms		80	34	25	12	15	166
	Total employment		2 588	2 300	3 477	3 548	16 144	28 057
	Average nber of employees/firm		32.4	67.6	139.1	295.7	1 076.3	169.0
	Standard deviation nber of empl.		(8.3)	(14.5)	(28.9)	(65.5)	(522.0)	(333.0)
Textile and leather ind.	Number of firms		236	39	31	22	24	352
	Total employment		6 338	2 559	4 029	6 138	38 205	57 269
	Average nber of employees/firm		26.9	65.6	130.0	279.0	1 591.9	162.7
	Standard deviation nber of empl.		(7.3)	(13.5)	(27.7)	(57.5)	(1 652.3)	(577.3)
Wood industry	Number of firms		166	31	2	8	4	211
	Total employment		4 600	1 944	247	2 220	3 784	12 795
	Average nber of employees/firm		27.7	62.7	123.5	277.5	946.0	60.6
	Standard deviation nber of empl.		(7.2)	(15.1)	(30.4)	(66.6)	(380.1)	(141.1)
Number of Firms			1 113	300	180	151	109	1 853
Total employment			31 356	19 597	24 237	44 148	139 415	258 753
Average nber of employees/firm			28.2	65.3	134.7	292.4	1 279.0	139.6
Standard deviation nber of empl.			7.8	13.4	27.8	72.1	1 085.2	394.9

Source: World Bank, RPED Nigeria, 2001.

In short, the sample frame exhibits two prominent characteristics: the weight of the Lagos and south region and the dominance of firms with more than 500 workers in total employment. These features were taken into account in the design of the sample. To maintain a minimal size and retain the almost binary character of the size distribution of firms, the size variable was divided between "other" and "very large" firms.⁵ Then, clusters were defined on the basis of the location, size, and sectors of firm activity. This three-level stratification implied 47 clusters, each of N_h elementary units ($h = 1, 2, \dots, 47$).

⁵ The "very large" size class includes any firm with more than 500 employees, while the "other" size class encompasses everything else.

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As a whole, the representativeness of the sample frame compared to the firm population was quite good. While it "only" included 11.8 percent of the firms, the sample frame accounted for 71.4 of the employment in manufacturing. In addition, the representativeness of each individual cluster ranged between 20 and 100 percent of the within-cluster employment. As it stands, the sample frame provided a good picture of the entire population of manufacturing firms in Nigeria in 1996.

The Sample

Following the stratification of the sample frame, firms were selected randomly inside each cluster (n_h firms for each cluster). A sample of 311 firms was thus drawn with a sampling rate of 16.8 percent. The structure of the theoretical sample was such that "very large" firms had an overall higher probability of being selected than firms of the "other" size class.

The sample effectively surveyed was a little different but retained the major characteristics of the theoretical sample and the sample frame: the importance of firms with more than 500 workers and the prominence the Lagos and south region. It included 232 firms, which represents a sampling rate of 12.5 percent. Firms with more than 500 workers accounted for 65 percent of the sample employment, and 53 percent of enterprises were located in the Lagos and south region, which accounts for 57 percent of the employment in the sample (Tables 2.3 and 2.4). The difference between the theoretical and the surveyed sample is explained by the fact that: (i) some firms refused to be interviewed (often small ones); and (ii) some of the other firms either no longer existed or had changed activities. In total, about a third of the firms listed in the theoretical sample were no longer relevant for the survey exercise. These "missing" firms were replaced with "new" firms having the same characteristics as those which had been removed or were no longer relevant.⁶

Tables 2.3 and Table 2.4 provide partial information on the structure of the sample in terms of the distribution of the stratification variables, particularly for employment. In effect, employment data from the selected sample were for the year 2000, whereas the employment data used for generating the sample frame dated back to 1996. This raises a major question. While the sample may have represented correctly the situation of firms as of 1996, was it still valid for 2000? The issue is difficult to tackle because reliable data for 2000 are unavailable. It is, however, possible to assess the validity of the surveyed sample with respect to the situation of Nigerian manufacturing in 2000 by assuming that the relevant distributions (with respect to size, sector, and location of the firms) remained constant between 1996 and 2000. This hypothesis seems reasonable because it allows for a change in the total number of firms and employees between the two dates but assumes that their overall proportions derived from the 1996 sample frame were unchanged in 2000. The next three charts compare the distributions of employment from the sample frame and the surveyed sample, respectively, for the size of firms, their sector of activity, and their location.

⁶ Replacements had to be in the same sector of activity, be of a similar size, and operate in the same location.

Table 2.3: Structure of the Surveyed Sample by Sector and Region

		Lagos and South			Total
		East Region	Region	North Region	
Chemicals/paints	Number of firms	5	17	4	26
	Total employment	285	5 281	947	6 513
Food/Beverage	Number of firms	8	18	8	34
	Total employment	2 559	9 523	1 771	13 853
Metal	Number of firms	14	23	8	45
	Total employment	2 590	3 870	1 741	8 201
Non-Metal	Number of firms	na	4	1	5
	Total employment	na	413	98	511
Paper/Printing/Publishing	Number of firms	4	19	4	27
	Total employment	149	2 019	483	2 651
Pharmaceuticals	Number of firms	2	16	3	21
	Total employment	461	6 568	289	7 318
Plastics	Number of firms	6	10	14	30
	Total employment	938	2 177	1 214	4 329
Textile	Number of firms	6	13	15	34
	Total employment	3 546	10 523	12 970	27 039
Wood	Number of firms	2	5	3	10
	Total employment	60	560	60	680
Number of firms		47	125	60	232
Total employment		10 588	40 934	19 573	71 095

Source: World Bank, RPED Nigeria, 2001.

Table 2.4: Structure of the Surveyed Sample by Sector and Size

Sector		Size	20-49	50-99	100-199	200-499	500 +	Total
Chemicals/paints	Number of firms		9	2	7	5	3	26
	Total employment		213	151	927	1 631	3 591	6 513
Food/Beverage	Number of firms		5	6	9	7	7	34
	Total employment		140	424	1 238	2 175	9 876	13 853
Metal	Number of firms		8	12	12	10	3	45
	Total employment		247	849	1 668	2 783	2 654	8 201
Non-Metal	Number of firms		2	1	2	na	na	5
	Total employment		71	98	342	na	na	511
Paper/Printing/Publishing	Number of firms		12	6	4	5	na	27
	Total employment		351	429	570	1 301	na	2 651
Pharmaceuticals	Number of firms		6	6	4	4	1	21
	Total employment		164	422	589	1 182	4 961	7 318
Plastics	Number of firms		11	6	7	4	2	30
	Total employment		328	393	1 020	1 236	1 352	4 329
Textile	Number of firms		na	8	6	5	15	34
	Total employment		na	539	823	1 517	24 160	27 039
Wood	Number of firms		8	na	na	2	na	10
	Total employment		215	na	na	465	na	680
Number of firms			61	47	51	42	31	232
Total employment			1 729	3 305	7 177	12 290	46 594	71 095

Source: World Bank, RPED Nigeria, 2001.

Figure 2.1 reports the distribution of employment along the size classes defined in the sample frame. The names of the class below the range of employees will be kept for the rest of the report.

The distribution in the surveyed sample did not differ greatly from the distribution in the sample frame. However, firms of the "very large" size class had a larger share in the surveyed sample, whereas the situation was the opposite for "very small" enterprises. There was little variation for the other size classes. At the sector level (Figure 2.2), the two distributions differed quite significantly for a few sectors. Two extreme cases were the food and beverage sector (its share in employment was underestimated) and the textile sector (it was probably less important in reality). In addition, as shown by Figure 2.3, the surveyed sample reproduced quite well the distribution of employment by region.

Figure 2.1: Comparison of the Distribution of Employment by Size Class.

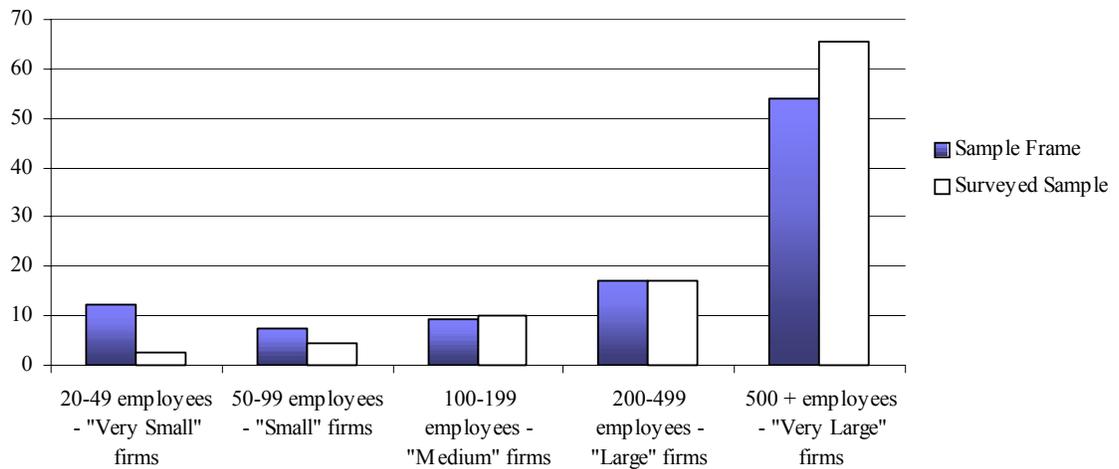


Figure 2.2: Comparison of the Distribution of Employment by Sector.

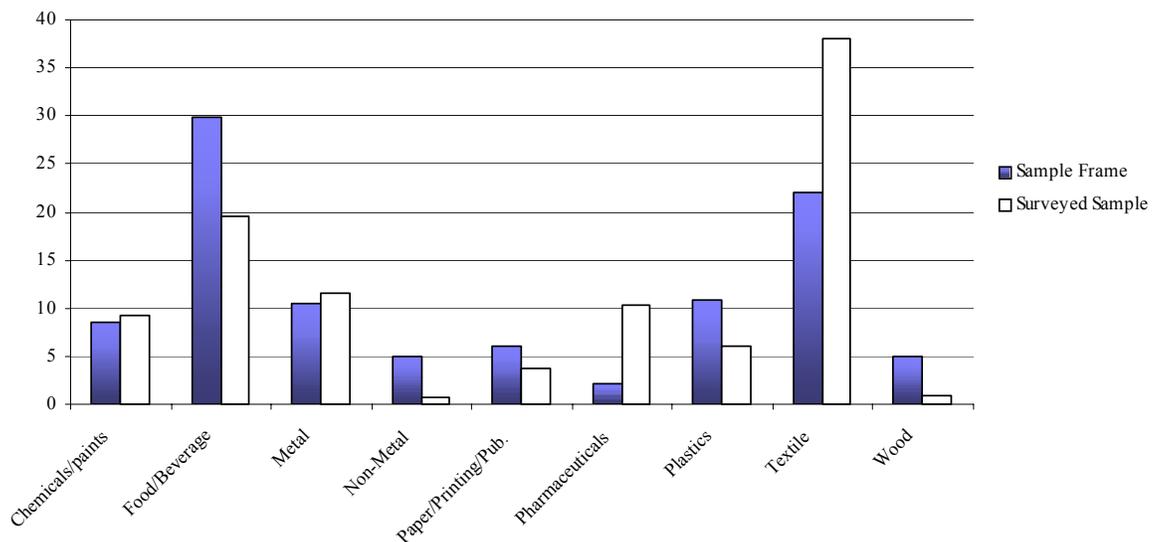
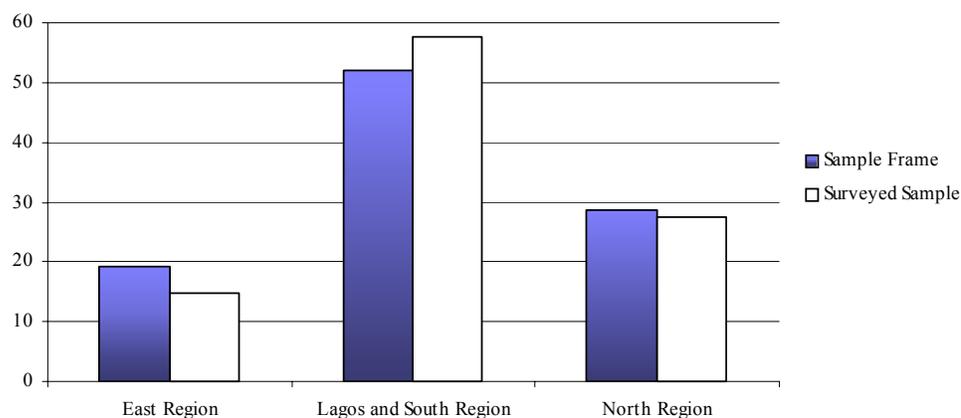


Figure 2.3: Comparison of the Distribution of Employment by Region



Finally, recent UN Industrial Development Organization (UNIDO) estimates suggest that employment in manufacturing firms with more than 20 employees was about 210,000 persons in 2000. This indicates that the surveyed sample, in which total employment equaled 71,095 workers, accounted for a third of the manufacturing employment in 2000. Moreover, according to recent estimates of value-added in manufacturing, the surveyed sample accounted for about 60 percent of the value-added in manufacturing as a whole (World Bank 2001b).

In short, the distribution of employment in the surveyed sample was probably quite correct with respect to the size of firms and their location; however, the "fit" was imperfect for the sectoral distribution. The surveyed sample accounted for a significant share of the sector's value-added and employment. Finally, it took into account the dominance of "very large" firms and the importance of the Lagos and South region. Hence, this surveyed sample can be considered as reasonably representative of the main characteristics of the manufacturing sector in Nigeria.

3. The Determinants of Productivity

There are various discussions of the determinants and constraints to raising firm-level productivity in Sub-Saharan Africa. Various studies using firm-level data that look at the determinants of productivity in Sub-Saharan Africa reveal the importance of education, new technology, and skill level of the labor force in raising productivity (Collier and Gunning 1999; Biggs et al. 1995; Pack and Paxson 1996; Pack 1993, 71–87). In general, the results of these studies are similar to productivity studies in other parts of the world. Learning mechanisms of various kinds are significant determinants of productivity. A study by Biggs et al. shows that job training of workers, new technology and information brought in by foreign firms, technical assistance contracts, and licensing arrangements all have significant impact on firm productivity (Biggs et al. 1995). However, these studies also show that African firms have relatively low access to these learning mechanisms; in particular, they argue convincingly that lack of access to new technology and information remains a severe constraint to firm growth.

Researchers such as Collier and Gunning and others argue that ethno-linguistic fractionalization is very high in Africa and is compounded by the low level of political rights (Collier and Gunning 1999, 64–111; Bates 1981). A related problem is the high level of corruption, which Collier and Gunning argue is much more costly to society than the centralized and therefore monopolistic corruption of Asia: bribes exceed the revenue-maximizing level and can even eliminate transactions. The court system is often unreliable and consequently not used very much to resolve financial disputes. African productivity has also suffered because of highly controlled economic regimes, which have resulted in high trade barriers and poor delivery of public services. Firms are often unable to cope with large shocks. The markets for insurance are also poorly developed and therefore do not provide coping mechanisms. Firms are often unable to meet international standards and deadlines because of lack of access to appropriate technology and information (Biggs et al. 1995). The degree of control exercised by governments over markets has also resulted in distortions—for example, firms in Cameroon enjoying special tax regimes accounted for 99 percent of sales in 1993 (Collier and Gunning 1999).

There are geographic constraints as well. According to some researchers, Sub-Saharan Africa is extraordinarily disadvantaged in terms of its geography. First of all, it is largely tropical, whereas most economic production in the world occurs in temperate zones, as shown by Bloom and Sachs (1998). Productivity growth in the tropics has been much slower than that of the temperate zones, which contain well over 90 percent of global expenditure on research and development as well as most of the patents generated worldwide. Bloom and Sachs argue that these differences in productivity and innovation are due to four related factors: agricultural technologies do not translate well across ecological zones and therefore have not benefited the tropics; temperate zones have much higher rates of endogenous technical change due to larger markets and populations engaging in innovation; tropical zones present particularly severe problems for health; and tropical zones are at a great distance from large markets.

The effect of inadequate food supplies on industrial growth is substantial. Low yields, variable rainfall, highly weathered soils, disease, and pests have resulted in low yields in the agricultural sector. Consequently, there is not enough labor freed up from the agricultural sector for use by firms in the industrial sector. Evidence from Western Europe, the United States, Asia, and Latin America suggests overwhelmingly that agricultural productivity must increase via technological change before the process of industrialization begins (Timmer 1992, 21–58). This process

generally occurs through the availability of high-yielding varieties of grain, new methods of irrigation and pest control, and other forms of technology. Even South Korea, which appeared to have industrialized without agricultural development, went through a remarkable period of agricultural productivity gains during the period preceding World War II (Kang and Ramachandran 1999, 783–801). To date, there has been no agricultural revolution in Africa to free up labor for industrial development and expansion. Also, the agricultural sector has not been able to provide a steady, cheap source of food for urban populations. A large fraction of the food supply in many African cities is imported. As a result of low growth in the agricultural sector, Africa's urban centers remain small by international standards and have not provided the human capital to fuel industrial expansion.

Another constraint to productivity in Sub-Saharan Africa is its very high rates of morbidity. Evidence from the effects of two diseases—malaria and HIV/AIDS—suggests profound consequences for firm-level productivity and overall economic growth. Econometric estimations by Gallup and Sachs show that the effect of malaria on GDP per capita is highly significant in cross-country regressions and could be responsible for a loss of more than 1 percent of GDP growth, after controlling for other variables (1998). They argue that these losses are particularly severe for Sub-Saharan Africa, which has 90 percent of the estimated number of malaria cases worldwide each year and is the only region of the world where one of the deadliest forms of malaria—*falciparum* malaria—is the dominant form of the disease. Estimates of the productivity effects of malaria vary widely. Researchers generally conclude that there is a loss of 1-5 days of productivity per adult illness and a loss of 1-4 days per sick child (Chima and Mills 1998). The annual economic burden to Sub-Saharan Africa was estimated at 0.6 percent of GDP in 1987; this number is now estimated to be over 1 percent due to increasing case severity and drug resistance (Shepherd et al. 1991, 199–203). Indirect consequences to economic productivity via reduced foreign direct investment and lack of technological diffusion could also be significant. (The effect of AIDS is discussed in further detail in the last chapter of this report.)

The RPED survey of Nigeria reveals some interesting results with regard to firm productivity. RPED surveyors interviewed over 200 firms in Nigeria during March-April 2001. These firms are spread over nine sectors—chemicals/paints, food/beverage, metal, non-metal, paper-printing-publishing, pharmaceuticals, plastic, textiles, and wood. Firms in five different size classes were interviewed—micro (less than 50 employees), small (51 to 99 employees), medium (100 to 199 employees), large (200 to 499 employees) and very large (500 or greater)—and an effort was made to include firms in the East Region, Lagos and the South Region and the North. Of the 232 firms in the survey, 61 were micro/very small, 47 were small, 51 were medium-sized, 42 were large, and 31 were very large.

Value-added per worker (measured in US dollars) reveals some interesting differences between different types of firms. Table 3.1 shows value-added per worker in various types of firms. Value-added per worker is (not unpredictably) driven by firm size; the smallest firms have the lowest value-added and the very large firms have a value-added per worker significantly greater than other types of firms. Local firms have less than half the value-added of firms with foreign equity and firms owned by Black African entrepreneurs have a lower value-added than firms owned by entrepreneurs of Indian, European, and Middle Eastern descent.

Table 3.1: Value-Added Per Worker in USD

	Value-Added/Worker	N
Local	3,137.52 (3,777.80)	93
Foreign	8,790.12 (9,673.41)	78
African	4,460.05 (6,081.85)	106
Non-African	7,791.56 (9,433.69)	63
Micro	2,765.58 (5,663.97)	48
Small	3,859.39 (5,529.24)	42
Medium	5,020.36 (7,258.61)	46
Large	4,198.73 (4,401.79)	35
Very Large	11,094.26 (12,767.19)	28

Source: World Bank, RPED Nigeria, 2001.

Value-added for the sample as a whole is about \$5,000 per worker. However, there is a quite a lot of variance by sector, as seen in Table 3.2. The food processing sector has the highest value-added—over \$9,000 per worker; value-added in other sectors is considerably smaller. The determinants of value-added in Nigeria will be explored further in the next section. However, it is interesting to note that the mean age range of equipment is fairly high—the mean value is 3.5 on a scale of 1-5, which translates to 10-20 years; and capacity utilization hovers around 50 percent with a minimum value in the sample of 26 percent. Average value of sales per firm is around \$10 million, which is substantially larger than average value of sales in most countries in Sub-Saharan Africa. The average number of employees in our sample at the time of the survey was 329, with a minimum of 5 and a maximum of almost 5000. Table 3.3 describes the data with respect to firm sales and number of employees. The mean number of employees has declined somewhat in the early to mid-1990s and then risen slightly at the end of the decade. Overall, there has been virtually no growth in employment in Nigeria.

Table 3.2: Value-Added Per Worker By Sector in USD

	Value-Added/Worker	N
All Sectors	4,941.55 (7,636.97)	
Chemical	6,122.60 (6,265.81)	25
Food	9,439.04 (13,368.35)	26
Metal	4,380.73 (7,022.35)	42
Non—metal	4,006.01 (3,268.24)	5
Paper	3,242.03 (4,737.46)	22
Pharmaceuticals	3,715.95 (5,102.91)	18
Plastics	5,173.85 (6,919.73)	24
Textiles	3,742.69 (6,506.00)	30
Wood	886.20 (590.51)	7

Source: World Bank, RPED Nigeria, 2001.

Table 3.3: Average Firm Sales in 1999 (Naira)

Mean (Whole Sample)	1,001,833,365 (3,768,911,857)
Micro	44,057,431 (81,423,742)
Small	128,888,302 (185,797,144)
Medium	310,490,955 (482,038,162)
Large	634,661,597 (756,833,234)
Very Large	4,241,454,729 (4,822,594,504)
Locally Owned	208,112,858 (483,338,939)
Foreign Equity	1,627,384,935 (3,304,855,941)
African	534,249,915 (1,754,642,411)
Non-African	1,364,528,203 (3,045,700,087)

Source: World Bank, RPED Nigeria, 2001.

Lack of mobility in the above table is reflected in the percentages along the diagonal in Tables 3.4A-3.4C. The numbers below the diagonal reflect firms that moved up from their initial size class, while the numbers above the diagonal reflect firms that downsized. As described by the tables, there has been a great deal of mobility, except for the smallest size group. Of the firms that started out very small (less than 50 employees), 48 percent remained in the same size class, while the remainder graduated to the next two size groups. Only one firm in the sample graduated from the smallest size class to the largest. Firms in the small size class (50-99 employees) had the greatest upward mobility, with 20 percent of firms remaining in their initial size class, while 65 percent of firms graduated to a higher level, 20 percent of which reached the very large size class. For larger firms, there was both upward and downward mobility. Of firms that started out large (200-499 employees), only 20 percent remained in that size class. About 55 percent of firms downsized, while 35 percent moved up. Similarly, in the largest size class, 60 percent remained very large, while 40 percent downsized.

Table 3.4A: Mobility of Firms from Start to Present, Classified by Size at Start

Current Size	Size at Start				
	Very Small	Small	Medium	Large	Very Large
Very Small	48.51	15.00	12.50	5.00	0.00
Small	26.73	20.00	6.25	10.00	10.00
Medium	15.84	25.00	37.50	30.00	10.00
Large	7.92	20.00	31.25	20.00	20.00
Very Large	0.99	20.00	12.50	35.00	60.00

Source: World Bank, RPED Nigeria, 2001.

Table 3.4B: Mobility of Firms during 1990–2000, Classified by Size in 1990

Current Size	Size in 1990				
	Very Small	Small	Medium	Large	Very Large
Very Small	40.00	23.81	11.11	3.70	0.00
Small	48.57	33.33	25.93	18.52	0.00
Medium	8.57	33.33	29.63	29.63	10.34
Large	2.86	9.52	29.63	37.04	24.14
Very Large	0.00	0.00	3.70	11.11	65.52

Source: World Bank, RPED Nigeria, 2001.

Table 3.4C: Changes in Total Employment 1990–2000 by Initial Firm Size (1990)

	Total employment in 1990	Total employment in 2000	Employment change
Very Small	878	2,181	1,303
Small	1,451	2,304	853
Medium	3,772	4,236	464
Large	7,796	6,787	-1,009
Very Large	43,217	36,623	-6,594

Source: World Bank, RPED Nigeria, 2001.

Examining mobility over the period 1990–2000, we see that firms have not been stagnating during this period. A majority of firms have moved up from their initial size class in all size categories, except for the large firms. About 37 percent of large firms remained large, but more than 50 percent of them downsized to the lower size classes. Only 11 percent moved up to the largest size class.

Overall, in our sample, we find that total manufacturing employment over structural adjustment period declined from 57,114 employees to 52,131 employees, for firms that existed over the entire period. This number excludes exits and does not include entrants during the structural adjustment period. However, the aggregate number masks the dispersion between firms. Changes in employment by firm size are shown in Table 3.4C.

As seen in this table, all three of the smaller size categories added employees during this period. Most of the employment losses in manufacturing came from the largest size class. Insofar as the

sector was protected and inefficient before liberalization, falling firm size may in fact indicate a move toward greater efficiency, a topic that is examined in detail elsewhere in this study.

Table 3.4D: Employment Change During 1990–2000 (Totals, by Sector)

Sector	Total Empt in 1990	Total Empt in 2000	Employment Change	N
Food	3,316	4,213	897	13
Wood	240	478	238	3
Furniture	909	261	-648	4
Textile	22,431	19,991	-2,440	18
Garments	25	57	32	1
Metal	3,906	2,799	-1,107	23
Mach. & tools	2,727	3,183	456	9
Leather	810	277	-533	4
Non-Metal	1,544	908	-636	10
Beverage	7,092	5,145	-1,947	4
Chemicals	5,496	5,232	-264	14
Pharmaceutical	5,254	6,058	804	12
Plastics	1,713	1,962	249	11

Source: World Bank, RPED Nigeria, 2001.

In the above discussion, the entrants during the 1990-2000 period were excluded. Did new firms enter during this period? If they did, were these just survival enterprises created by the unemployed, or were these started by true entrepreneurs? To examine this issue, we look at the characteristics of firms that started operations during the period 1990-2000. Within our sample, we have 38 startups. The average startup size for these firms was 53 employees, with an average of 103 current employees. In total, these firms created 2,034 jobs at start and have 3,931 current employees. Most new firms grew during the period 1990-2000, providing some evidence that the period of structural adjustment did not coincide with de-industrialization, as some have suggested.

Our sector data show that average firm size in most sectors has declined slightly except for the wood sector where average employment has risen steadily since 1994. Table 3.5 describes the number of employees per firm, by size category and type of firm in 1990, 1994, 1998, 1999, and 2000. This table reflects the economic crisis of the 1990s. In almost every size category, Nigerian firms suffered a loss of employment between 1990 and 2000. Average number of employees per firm fell by 12 percent between 1990 and 1994, 7 percent between 1994 and 1998, 5 percent between 1998 and 1999, and another 6.6 percent the following year. The percentage change in mean number of employees between 1990 and 2000 is almost 28 percent. In other words, firms are a third smaller now than they were a decade ago.

Table 3.5: Average Employment by Firm Size

	1990	1994	1998	1999	2000
Whole Sample	410.9 (806.5)	361.2 (758.6)	335.5 (715.6)	317.8 689.3	296.6 638.1
Micro	57.4 (65.5)	63.4 (66.71)	39.71 (44.8)	35.77 (41.6)	28.88 (10.66)
Small	92.75 (79.4)	90.39 (76.50)	76.18 (36.72)	68.32 (20.92)	70.32 (13.98)
Medium	206.7 (214.14)	143.02 (80.86)	148.82 (71.09)	150.70 (56.35)	140.74 (26.71)
Large	287.54 (195.28)	308.24 (192.20)	292.18 (119.19)	289.92 (105.56)	292.80 (79.84)
Very Large	1,640.33 (1,545.5)	1,716.6 (1,603.1)	1,623.6 (1,376.4)	1,596.4 (1,397.3)	1,482.2 (1,229.2)
African	220.22 (484.64)	223.95 (531.02)	200.22 (497.49)	194.02 (500.44)	182.34 (468.69)
Non-African	622.02 (1,113.30)	554.12 (1,054.46)	553.42 (974.82)	484.86 (902.44)	479.08 (819.83)
Local	152.73 (193.45)	151.00 (213.55)	130.28 (187.37)	125.01 (178.60)	121.61 (158.92)
Foreign	654.05 (1,105.36)	602.51 (1,110.20)	590.69 (1,030.74)	533.36 (982.16)	520.59 (907.32)

Source: World Bank, RPED Nigeria, 2001

Both African-owned and non-African-owned firms were hit by the crises of the 1990s; African firms declined from 220 employees to 182 (a change of 17 percent), while non-African firms declined by 23 percent. Local and foreign firms also seem to have been affected fairly similarly; both types of firms declined in size during the 1990s.

Table 3.6 describes capacity utilization in the sample. Our data show that capacity utilization averages around 52 percent for the entire sample, with very large firms utilizing significantly more capacity (66 percent) than other firms. Foreign and non-African-owned firms also have greater capacity utilization than local and African-owned firms.

Table 3.6: Capacity Utilization (%)

Whole Sample	52.14 (26.62)
Micro	46.02 (25.36)
Small	51.19 (31.38)
Medium	51.47 (28.83)
Large	52.14 (21.16)
Very Large	66.05 (19.07)
Local	49.00 (26.22)
Foreign	56.21 (26.86)
African	48.39 (26.43)
Non-African	58.65 (26.51)

Source: World Bank, RPED Nigeria, 2001.

Tables 3.7 and 3.8 describe the factors driving productivity in the Nigerian private sector. The results are not surprising—inputs of labor and capital are highly significant in determining value-added per worker. The ratio of skilled to unskilled workers is significant at the 10 percent level of confidence, as are capacity utilization and age of the firm. The percentage of foreign equity in the firm is a highly significant determinant of productivity, and the percentage of inputs imported is significant at the 5 percent level. The age of equipment used is negatively and significantly correlated with value-added.

When firms are disaggregated into four categories—purely locally owned, firms with some foreign equity, firms that are Black African-owned, and firms that are owned by ethnic minorities (referred to in the table as Non-African firms)—the results are far stronger for foreign-owned and ethnic minority-owned firms than for locally owned and African firms. Presumably this is due to lack of variance in locally owned and African firms; these tend to be smaller with lower value-added per worker. Finally, it is interesting to note that worker training and the incidence of technical assistance contracts and foreign licenses were not significant determinants of productivity.

Table 3.7: Determinants of Productivity in the Nigerian Private Sector

Intercept	6.92** (1.05)
Ln(capital)	0.25** (0.06)
Ln(labor)	0.99** (0.12)
Skill ratio	2.18+ (1.31)
Capacity	0.007+ (0.004)
Age of firm	0.01+ (0.009)
Percentage of foreign equity	0.007** (0.003)
Imports	0.0056* (0.0025)
Age of equipment	-0.552** (0.211)
N	134
R-squared	0.73
F-statistic	42.92

Source: World Bank, RPED Nigeria, 2001

Table 3.8: Firm Productivity by Ownership

	Locally owned Firms	Firms with foreign equity	African firms	Non-African firms
Intercept	8.29** (1.54)	7.24** (1.54)	6.897** (1.39)	7.09** (1.76)
Ln(capital)	0.21* (0.09)	0.26** (0.08)	0.23* (0.09)	0.26** (0.09)
Ln(labor)	0.98** (0.19)	0.91** (0.14)	1.25** (0.18)	0.81** (0.16)
Skill ratio	0.33 (1.95)	4.62** (1.74)	0.36 (1.76)	5.69** (2.11)
Capacity	0.002 (0.007)	0.01* (0.005)	0.004 (0.006)	0.009 (0.006)
Age of firm	0.003 (0.015)	0.018+ (0.011)	-0.0003 (0.0133)	0.031** (0.012)
Imports	0.005 (0.004)	0.007* (0.003)	0.007* (0.003)	0.008* (0.004)
Age of equipment	-0.458 (0.333)	-0.695** (0.263)	-0.51 (0.29)	-0.551+ (0.320)
N	71	62	81	51
R-squared	0.57	0.75	0.67	0.72
F-statistic	12.19	24.19	21.59	16.33

Source: World Bank, RPED Nigeria, 2001

Comparative Productivity and the Cost of Labor: Nigeria, Sub-Saharan Africa, and the Rest of the Developing World

The productivity of Nigerian labor is crucial to its competitiveness, both in the short and long term. In particular, it is useful to compare Nigeria to other countries in Asia and Sub-Saharan Africa. An examination of the Nigerian wage to value-added ratio gives some cause for concern when compared with this ratio in other countries.

One of the key issues in the private sector is the competitiveness of African labor. While some researchers believe that Africa can be competitive in international markets, there is compelling evidence to suggest that there are factors unique to Africa that have driven the cost of labor higher there than in other countries. A calculation of unit labor cost in Africa compared to other parts of the world is revealing, as shown by Lindauer and Velenchik (1994). Unit labor cost measures the total cost per unit of output in a common currency, which enables international comparisons of competitiveness of labor. This measure is driven by the ratio of wages to productivity and is defined as:

$$ULC = (w.L/Q).(1/e)$$

where w is the manufacturing wage

L is the amount of labor employed

Q is a physical measure of output

e is the exchange rate defined as domestic currency per dollar.

Unit labor costs are therefore high in countries that have high wages and low labor productivity. Apart from overvalued exchange rates that have hampered Africa's competitiveness, the data on unit labor costs show that Africa has higher ratios of wage to labor productivity relative to Asia at roughly equivalent stages of development. When data from Africa for the 1980s are compared with Asian data from the 1960s and 1970s, it is clear that earnings in Africa are about two-thirds higher than was the case historically in Asia, and African productivity is about one-fourth lower.

Two explanations for the phenomenon of high wages are plausible: one is the effect of unionization and labor regulations that have resulted in high wages in the formal sector, and the other is the low man to land ratio in Africa. There is some evidence to back up the theory that non-market forces have resulted in higher wages in Africa, whereas wage increases in Asia have been tempered by abundant supplies of cheap labor. The difference is that the marginal product of labor in agriculture continues to be high in Sub-Saharan Africa. Thus, the relatively high opportunity cost of labor in African manufacturing raises unit labor costs and reduces manufacturing competitiveness. Lindauer and Velenchik also pose a very interesting hypothesis regarding the supply of female labor, which is crucial to the success of countries that have relied on manufactured exports. They argue that in sharp contrast to Asia, African women are productively employed in the agricultural sector. Consequently, unlike Asia, a large pool of relatively cheap female labor is not available for employment in the manufacturing sector in Africa.

Unfortunately, data limitations make it difficult for us to do a unit labor cost comparison for Nigeria. However, we have a cruder estimate to do some comparisons—the wage to value-added ratio (or the ratio of wages to productivity). Data on both wages and productivity are available from surveys of manufacturing in many countries. This ratio is useful to consider because we do not have to have an exchange rate conversion to a common currency or physical measures of productivity (which are required for unit labor costs, and are very hard to come by).

A comparison of the current situation in Sub-Saharan Africa (and Nigeria in particular) with the historical experiences of already-industrialized Asian economies is revealing. The idea here is to consider Asian countries at points in time when their economic circumstances, particularly with respect to per capita income, were roughly similar to Africa today. Since we may be interested in the ability of African countries to follow the industrialization patterns of East and Southeast Asia, it is also useful to compare the current situation in Africa with the historical situation in Asia. A smaller ratio indicates a more competitive labor force and manufacturing sector.

Table 3.9 describes the ratio of wages to productivity (value-added) for several countries in Asia and Sub-Saharan Africa, including Nigeria in 2001. The ratio for Nigeria in 2001 (0.26) is clearly comparable with that of Asian countries in the 1960s and 1970s. It is higher than Taiwan (0.16), but similar to Indonesia (0.21), South Korea (0.26), Malaysia (0.27), and Thailand (0.24). Table 3.9 also shows that the ratio of wages to productivity for Nigeria in 2001 is considerably lower than the values for other African countries in the 1980s. However, wage to productivity has risen for Nigeria itself; in 1983, Nigeria was more competitive than it is now, with a ratio of 0.20. This change in ratio is presumably because wages have risen more than productivity in the past two decades.

Table 3.9: Ratio of Wages to Value-added

Country	Year	Ratio of Wages to Productivity
Africa		
Botswana	1990	0.39
Cameroon	1978	0.39
Cote d'Ivoire	1982	0.31
Ghana	1983	0.23
Kenya	1988	0.41
Madagascar	1984	0.36
Malawi	1983	0.59
Mauritius	1987	0.50
Nigeria	2001	0.26 (0.20 in 1983)
Senegal	1984	0.43
Sierra Leone	1986	0.31
Tanzania	1985	0.35
Zimbabwe	1987	0.37
Asia		
Indonesia	1981	0.21
South Korea	1963	0.26
Malaysia	1970	0.27
Singapore	1963	0.35
Taiwan	1961	0.16
Thailand	1970	0.24

4. The Manufacturing Labor Market in Nigeria

The analysis of labor markets has an important bearing on a wide variety of issues of economic and social policy. A proper understanding of the labor market in Nigeria is critical both for its macroeconomic stability and a sustainable improvement in living standards. Unfortunately, there is very little recent information available for Nigeria on the topic. The RPED survey, conducted in Nigeria in November 2000, aims to fill this void. This section examines the structure of the manufacturing labor market in Nigeria, based on detailed firm level data available through this survey.

Nigeria is a densely populated country, which had roughly 49 million persons in its labor force in 1999 (i.e., about 35-37 percent of the total population) (World Bank 2001a). The population and the labor force are on the rise, while labor demand is at best stable or even declining. There is a high rate of unemployment. Estimates for 1998 from the Federal Government indicate that the unemployment rate in the formal labor market reached as high as 17.2 percent in the Lagos State (Dabalen, Oni, and Adekola 2001). The bulk of unemployed workers feed a growing informal sector. Usually, this informal sector provides a low level of income and sometimes finds itself competing with the formal sector. Overall, the manufacturing labor market is a tiny fraction of the Nigerian labor market. According to the last estimate available, it accounted for about 7 percent of employment in 1990 (World Bank 2001b). It is, however, plausible that this proportion has decreased since then, as population grew quickly in the 1990s, and the manufacturing sector was in crisis during most of this period.

A large section of the RPED survey in Nigeria was devoted to the collection of labor data. The 232 surveyed enterprises provided information on a wide variety of issues ranging from technology, finance, the structure and compensation of the labor force, basic accounting data, regulation, and infrastructure. The interview of workers, a sample of up to 10 employees in each firm, provided information on their starting and current wages, occupation, union status, education, tenure, apprenticeship history, layoff experience, and some demographic data. This section draws on both the general and worker sections of the questionnaire. In the first part, the salient features of employment in Nigerian manufacturing are described. The second part provides information on the characteristics of the workforce. Finally, issues of labor earnings and wage determination in Nigerian manufacturing are examined.

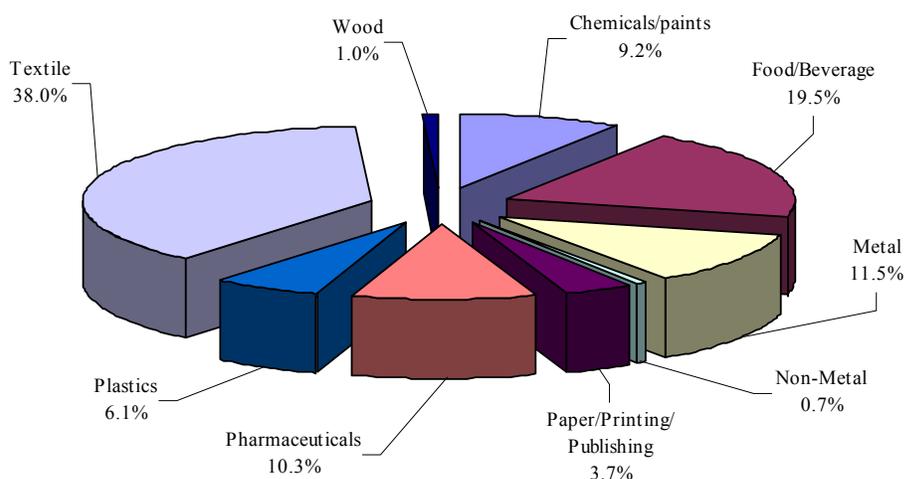
Structure of the Manufacturing Labor Market

Macroeconomic data suggest that employment in manufacturing has been declining over the years and that the distribution of employment remains quite uneven across regions and sectors. Using our detailed firm level survey data, we examine the patterns of employment within manufacturing, and the changes in employment across sectors during the structural adjustment period (1990–2000).

Within the sample, employment in manufacturing tends to concentrate in the "textile" and "food and beverage" industries, two labor-intensive activities. They respectively account for 38 percent

and 19.5 percent of the employment in 2000 (Figure 4.1).⁷ As expected, the distribution of firms along size class is almost linear: the larger the size class, the larger the share in total employment (Table A.1). Formal firms of the "very small" size class only account for 2.4 percent of the sample employment while very large enterprises employ more than 65 percent of the workers.⁸ While this result is due largely to the sample design and structure, it is interesting to note such a size distribution is consistent with what was found in RPED surveys in other African countries, where even a weighted sample yielded similar results. Finally, the importance of the south of the country is obvious in terms of employment. While about 53 percent of the firms are located in the Lagos area and the south of the country, they account for about 58 percent of the employment in 2000 (Table A.2).

Figure 4.1: Sectoral Structure of Employment in 2000



Source: *World Bank, RPED Nigeria, 2001.*

Another feature of the distribution of employment—the share of non-production workers in firm's employment—is of special interest. It is often argued that one possible explanation of the comparatively high cost of labor in Africa is attributable to an excess of non-production workers, the so-called white collars (Mazaheri and Mazumdar 1999). Previous RPED surveys have found that in other African countries⁹ non-production workers comprise between 20 to 30 percent of the workforce.¹⁰ In the Nigeria sample we find about 37 percent of the workforce is composed of

⁷ As mentioned in the section on sampling, the structure of the sample probably overestimates the size of the "textile" sector and underestimates the size of the "food and beverage" industry. However, this does not change the fact that these two sectors are the main providers of wage employment in Nigerian manufacturing.

⁸ Size classes are defined as follows:

- 20 to 49 permanent employees: very small
- 50 to 99 permanent employees: small
- 100 to 199 permanent employees: medium
- 200 to 499 permanent employees: large
- 500 and more permanent employees: very large

⁹ Other African countries surveyed by the RPED program include: Cameroon, Côte d'Ivoire, Kenya, Ghana, Mozambique, Tanzania, Zambia, and Zimbabwe.

¹⁰ Non-production workers or "white collars" are defined as any worker who, inside a firm, *does not* belong to the following job positions related to the productive process: technician, foremen and supervisors, other production workers, machine, maintenance and repair workers.

non-production workers, a figure higher than in many other African countries (Table 4.1 and Table A.3). However, as found in other studies, the share of non-production workers decreases

Table 4.1. Percentage of Non-production Workers by Sector and Size Class

		Very Small	Small	Medium	Large	Very Large	Total
Chemicals/paints	Average percentage	63.9	55.3	33.2	41.3	19.5	44.8
	Standard Deviation	(12.46)	(0.39)	(14.82)	(25.04)	(11.09)	(21.64)
Food/Beverage	Average percentage	54.6	37.1	45.3	37.6	38.9	42.5
	Standard Deviation	(22.33)	(13.07)	(15.20)	(5.88)	(9.94)	(14.29)
Metal	Average percentage	47.2	34.8	35.6	32.9	15.2	35.2
	Standard Deviation	(16.13)	(8.81)	(16.12)	(16.26)	(8.97)	(15.30)
Non-Metal	Average percentage	50.0	72.7	35.1	na	na	48.6
	Standard Deviation	(0.00)	na	(6.69)	na	na	(15.76)
Paper/Printing/Publishing	Average percentage	38.7	31.8	37.8	30.1	na	35.5
	Standard Deviation	(22.46)	(6.61)	(16.52)	(12.28)	na	(17.05)
Pharmaceuticals	Average percentage	52.2	45.7	51.0	43.9	na	48.6
	Standard Deviation	(17.69)	(19.25)	(14.01)	(20.24)	na	(16.74)
Plastics	Average percentage	46.6	30.3	30.2	19.8	16.9	34.0
	Standard Deviation	(20.77)	(5.73)	(16.66)	(15.00)	(0.45)	(18.39)
Textile	Average percentage	na	33.2	23.5	25.9	20.1	24.8
	Standard Deviation	na	(12.29)	(7.85)	(12.85)	(11.68)	(12.11)
Wood	Average percentage	40.4	na	na	12.1	na	34.7
	Standard Deviation	(23.66)	na	na	(1.94)	na	(24.05)
Average percentage		48.0	36.9	36.2	32.3	23.9	37.1
Standard Deviation		20.28	13.19	15.73	16.13	13.29	17.92

Source: *World Bank, RPED Nigeria, 2001.*

when firm size increases. By sector, the "textile" industry has the lowest share of non-production workers (24.8 percent), while the "non-metal" and "pharmaceutical" sectors employ the most non-production workers (48.6 percent). Apart from possible differences in production technologies, these numbers can be explained by the fact that non-production workers are, to some extent, an "overhead" cost, which is spread over a larger number of employees in larger firms. Hence, the "textile" sector, which is composed mainly of firms from the "large" and "very large" size classes, mitigates the "burden" of non-production workers. On the other hand, the "non-metal" and "pharmaceutical" sectors are mainly composed of firms from the "very small" to "medium" size classes, where the weight of non-production workers is greater.

Next, we examine changes in manufacturing employment during the structural adjustment period. Employment data for the period 1990-2000 is available only for firms that existed during the entire period and excludes entry and exits. Since most of the firm volatility (entry/exit) occurs at the lower end of the size distribution, an examination of employment changes in existing firms provides a good picture of changes in employment within manufacturing. We see that overall, in our sample, total manufacturing employment over the structural adjustment period declined from 57,114 to 52,131 employees for firms that existed over the entire period. Table 4.2 shows the changes in employment by firm size.

Table 4.2:
Changes in Total Employment over Structural Adjustment, by Initial Firm Size (1990)

	Total employment in 1990	Total employment in 2000	Employment change
Very Small	878	2,181	1,303
Small	1,451	2,304	853
Medium	3,772	4,236	464
Large	7,796	6,787	-1,009
Very Large	43,217	36,623	-6,594

As seen in Table 4.2, all three of the smaller size categories *added* employees during this period. Most of the employment losses in manufacturing came from the largest size class. This in itself does not reflect the process of deindustrialization or stagnation of the manufacturing sector. Insofar as the sector was protected and inefficient before liberalization, falling firm size may in fact indicate a move toward greater efficiency, a topic that is examined in detail elsewhere in this study.

In the above discussion, the entrants during the 1990–2000 period were excluded. Did new firms enter during this period? If they did, were these just survival enterprises created by the unemployed or were these started by true entrepreneurs? To examine this issue, we look at the characteristics of firms that started during the structural adjustment period. Within our sample, we have 38 startups. The average startup size for these firms was 53 employees, with an average of 103 current employees. In total, these firms created 2,034 jobs at start, and have 3,931 current employees. Most new firms grew during the structural adjustment period, refuting the theory that these were survival enterprises.

Apart from the distribution of firms and workers, two other elements may affect the structure of the manufacturing labor market: the type of labor contract in use and the role of labor unions. Most of the workforce in Nigeria—about 89 percent of the workers over the sample—hold full-time permanent contracts in manufacturing firms (Table A.4). The reliance on casual or part-time labor contracts is limited, indicating the rigidity of the labor market. When faced with a downturn in demand or any other shock, firms are thus likely to have difficulties in making the adjustment as permanent labor contracts entail more legal protection for workers. The only significant exception is the paper/printing/publishing industry in which about 21 percent of the workforce is made up of full-time casual workers and about 12 percent of part-time employees. Over the sample, smaller firms (those in the very small, small, and medium size classes) use more casual and part-time workers than larger firms (large and very large size class). The former tend to be more vulnerable to current economic conditions than the latter and may try to obtain some flexibility by using non-permanent workers. The importance of full-time permanent employees may also provide a possible explanation for the fact that manufacturing firms hire only a small number of extra workers when they are in a peak period (Table A.5).¹¹ Interestingly, the nature of the labor contracts implies that wages are almost always paid on a monthly basis and that the use of alternative methods of payment is limited. For instance, only 0.1 percent of the interviewed

¹¹ Firms hire between 8 and 12 workers in peak period, or about 2.5 to 4 percent of their average employment.

workers reported to be paid by the piece. The inflexibility of labor contracts makes it harder for firms to fire workers, and hence they have lower incentive to hire additional workers too.

The trade union movement, once a powerful force in Nigeria, was weakened during the 1990s by poor leadership and political repression from the various military governments (EIU 2001). Since the advent of democracy in 1999, labor unions have regained strength and staged several major protests against the administration. They succeeded in raising the minimum wage in 2000. In this context of re-birth of unions in Nigeria, it is especially interesting to look at the current degree of unionization of workers, as it may ultimately affect the design of labor regulations and the level of wages. At the beginning of 2001, according to the data, unions seem to remain a significant force. On average, almost 43 percent of the workers belong to a union (Table 4.3). This number is higher than all other seven Sub-Saharan African countries examined by RPED. Across those seven countries, the highest rate of unionization was in Zimbabwe, where 41.8 percent of workers belong to a union, while the lowest percentage of workers unionized was in Cameroon (19.6 percent) (Mazumdar and Mazaheri, 1999). The sectoral distribution of membership in unions is uneven. At the top end of the distribution is the textile sector in which 76.5 percent of the workers belong to a union. At the other extreme, quite surprisingly in some sense, no workers appear to be a member of any union in the wood sector. This is confirmed both by the discussions with the managers and the interviews with the employees. A possible explanation is firm size—most firms in the textile industry are large, while those in the wood sector are very small. We see that membership in unions appears to grow with the size of the enterprises. In very large firms, about 86 percent of the workers belong to a union, while membership is only 9.3 percent in very small firms. Another way of assessing the influence of unions is to check for the average number of days lost due to strikes triggered by these organizations. On average, only 2.4 days of production were lost in 2000. In line with the distribution of union membership, there is no clear pattern for the days of production lost across sectors, but the larger the size of the firms the larger the loss. In 2000, very large firms lost 7.3 days of production due to strikes.

Table 4.3: Union Membership and Labor Conflicts

<i>Average Percentage of Employees in a Labour Union</i>								
Chemicals/paints	Food/Beverage	Metal	Non-Metal	Paper/Printing/ Publishing	Pharmaceuticals	Plastics	Textile	Wood
34.3	38.4	49.6	38.5	46.7	18.0	33.2	76.5	0.0
Micro	Small	Medium	Large	Very Large	Total			
9.3	31.1	53.7	60.3	85.9	42.7			
<i>Average Number of Days Lost to Strikes in 2000</i>								
Chemicals/paints	Food/Beverage	Metal	Non-Metal	Paper/Printing/ Publishing	Pharmaceuticals	Plastics	Textile	Wood
1.2	1.2	1.8	1.2	1.4	0.2	1.8	6.6	7.1
Micro	Small	Large	Medium	Very Large	Total			
0.8	2.1	3.6	0.9	7.3	2.4			

Source: World Bank, RPED Nigeria, 2001.

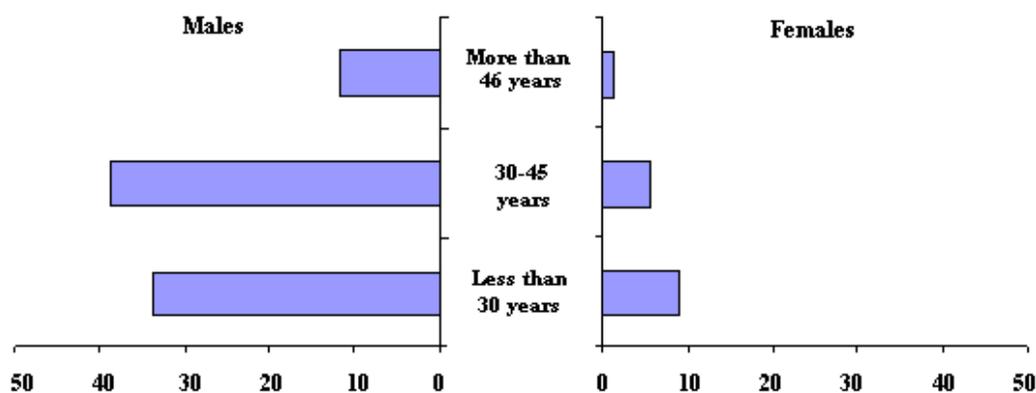
Characteristics of Workers

The main characteristics of the Nigerian workforce are presented below. An examination of their age, human capital, tenure, experience, and compensation practices provides an important insight into the functioning of the labor market and industrial performance as a whole.

Workers employed in Nigerian manufacturing tend to be middle-aged (on average 36 years old). Women are usually younger than their male colleagues. The dominant age group of workers in manufacturing is male employees in their thirties (Figure 4.2). Younger workers tend to concentrate in very small and small firms, while older ones are found in enterprises of a larger size (Table A.6). Not surprisingly, most of the time, the higher the hierarchical position, the older the workers. Seniority still plays a major role in Nigerian firms (Table A.7). These findings are very similar to those found in other African countries.

The mean tenure of the sample's workers (i.e., the period that they have been employed within the current firm) was about seven and a half years at the time of the survey. Technicians and foremen/supervisors are the two categories of employees that have stayed longer in their firms (respectively, 8.8 and 10.4 years). This is probably because there is greater firm specific training acquired by these workers to develop skills and losing them is costly for the enterprises. Usually, women have shorter tenure than their male co-workers (Table A.8). Outside experience is also significant. The interviewed employees had worked for about five years before entering their current firm. The employed managers have the largest stock of previous experience at 10 years (Table A.9).

Figure 4.2: Average Age and Gender Structure in Manufacturing Industry (%)



Source: *World Bank, RPED Nigeria, 2001.*

The issue of the qualification and education of the workforce is often debated in Nigeria. This is of paramount importance in a country of more than 120 million people where economic growth has been slow at best for the last decade. Links between growth and education come from the externalities generated by improved education levels (better adaptability, easier learning by doing), which in turn increase the stock of human capital and ultimately favor growth. The reality in Nigeria now is that graduates often complain about the lack of job opportunities in the formal sector, while firms emphasize the fact that students are poorly prepared for practical work (Dabalén, Oni, and Adekola 2001). This makes the previous type of endogenous growth

argument rather spurious at present. Workers need to be educated, but the type of education they receive is equally important. If workers are not receiving the “right” education, then they will receive lower returns to their human capital. The RPED data shed some light on this issue and the returns to education in Nigeria from a microeconomic standpoint.

The distribution of education level among workers is uneven (Table 4.4). While on average workers seem to be quite educated, 12.7 percent of them did not attend school beyond the modern school. Most of workers went to secondary school (42.3 percent) or followed technical/vocational training (about 25 percent). About 18 percent went to universities. Interestingly, no major difference appears between the level of training of men and women. This dominance of the secondary education in the workforce is very similar to what is found in many western African countries, but the proportion of employees with higher education is a slightly larger in Nigeria.

Table 4.4: Education of Employees (C.Pct)

	Male	Female	Total Sample
None	1.5	0.6	1.4
Primary	9.7	5.7	8.9
Modern Shool	2.4	2.1	2.4
Secondary School	41.7	44.9	42.3
Technical	18.6	14.5	17.8
Vocational	5.9	13.3	7.3
Bachelor	14.2	12.7	13.9
Master Degree or Higher	4.6	3.6	4.4
Professional	1.3	2.7	1.6

Source: *World Bank, RPED Nigeria, 2001*

The level of education of workers is likely to vary widely according to sectors, the size of firms and other stratification variables (Table 4.5). Not surprisingly, the largest proportion of workers with "high" education is found in sectors with significant technological requirements and relatively high capital intensity like pharmaceuticals, food/beverage, and chemicals/paints. Workers with "technical or vocational" training usually account for 20 to 26 percent of the workforce, with the exception of the metal and non-metal sectors, where the proportion is higher. Labor-intensive sectors with relatively low-skill requirements like wood, paper/printing/publishing, and textiles use the most employees with lower levels of education (below technical and vocational training). Interestingly, there is not clear-cut relationship between the size of the firms and the level of education of the employees, contrary to what is found in some other African countries such as Côte d'Ivoire, for example.

Table 4.5: Education of Workers (R.Pct)

	None or Primary	Middle or Secondary	Technical and Vocational	Higher
By Sector				
Chemicals/paints	8.1	47.2	21.3	23.4
Food/Beverage	8.5	38.8	26.0	26.7
Metal	11.8	37.4	30.7	20.1
Non-Metal	12.2	26.8	46.3	14.6
Paper/Printing/Publishing	6.9	60.4	21.2	11.5
Pharmaceuticals	6.8	42.2	22.4	28.6
Plastics	13.3	41.8	26.0	18.9
Textile	11.1	50.6	21.4	17.0
Wood	20.3	48.1	20.3	11.4
By Size Class				
Very small	12.2	48.4	25.1	14.2
Small	13.9	43.6	26.2	16.3
Medium	9.0	41.2	23.5	26.4
Large	6.1	46.3	22.5	25.1
Very Large	9.2	42.7	29.7	18.4
By Location				
East Region	9.3	43.8	21.6	25.2
Lagos and South Region	8.0	45.6	28.5	17.9
North Region	16.6	43.0	20.2	20.2
By type of Ownership				
Firms with Foreign Equity	9.9	41.7	25.7	22.6
Pure Local ownership	10.8	46.7	24.4	18.2

Source: World Bank, RPED Nigeria, 2001.

The educational distribution of workers varies significantly across regions, a fact to be related to the geographical distribution of the sectors. The largest proportion of workers with "high" education is found in the east region while comparatively the north region employs more workers with "no or primary" education. Comparatively, firms located in the Lagos and south region tend to use more workers with "middle/secondary" or "technical/vocational" training. Finally, it appears that foreign firms tend to have workers who are more educated than enterprises with local ownership. Usually, these firms tend to operate in more technical sectors where the skill requirements are higher and often provide higher wages to attract people with better education. The fact that the average level of education of the workforce is higher than other Sub-Saharan African countries may help explain why, according to our discussions with workers, relatively little training is provided. About 83 percent of the workers declare to have never received any training, either inside or outside their company (Table A.10). When training does occur, it seems to be more a concern for "large" or "very large" sized enterprises and benefits men more than women. The training period usually lasts from 5 to 6 weeks and, while it often implies ex post a higher hierarchical position, it translates into a higher wage only for about 14 percent of the trainees (Table A.11).

A factor that may contribute to a segmented labor market in Nigeria is the possible restricted geographical mobility of workers. According to Table 4.6, the distribution of workers by ethnic origin is very uneven. This suggests that the geographical segmentation of the labor market along ethnic lines remains important. Hence, for Nigerian employees, most workers tend to belong to the dominant ethnic group inside a region. In the east region, home of the Igbo group, almost 70 percent of the workers are from this ethnic group. Yoruba account for 59 percent of the employment in the Lagos and south region, while Hausa represent about 27 percent of the employment in the north. Employees of non-African origin tend to locate in the Lagos and south region and in the east region.

The division of the labor market along ethnic lines is not restricted to geographic location alone. It seems that some groups dominate in manufacturing employment and that some job positions are predominantly filled by member of specific ethnicities (Table A.12). The Igbo and Yoruba workers are the dominant ethnic groups in Nigerian manufacturing. They account respectively for about 27 and 39 percent of the workforce. The Igbo and Yoruba groups also provide the bulk of employed managers. Respectively, they account for about 30 and 39 percent of the managers. Interestingly, most of the production workers also come from these two groups, about 41 percent of Yoruba origin and 27 percent of Igbo. On the other hand, the Hausa group accounts for only 11 percent of the managerial positions and about 9 percent of the production workers. Workers of non-African origin tend to be concentrated in management or engineer positions.

Table 4.6: Distribution of Workers by Ethnic Origin and Region (R.Pct)

	Hausa	Igbo	Yoruba	European	Indian	Middle East	Other
East Region	2.2	69.8	6.8	0.0	0.0	1.6	19.6
Lagos and South Region	3.7	19.7	59.1	0.1	0.4	0.1	16.9
North Region	27.3	8.3	18.8	0.0	0.2	0.0	45.4

Source: *World Bank, RPED Nigeria, 2001.*

Labor Market Earnings

The following wage data come from a subsection of the survey in which a sample of up to 10 workers was interviewed in each firm. There were 1,798 interviews conducted, with 1,775 of them having complete answers, and those have been analyzed here. At the firm level, at least one worker in each major job position was interviewed. The analysis focuses both on the level and the structure of worker compensation and takes into account all of the components of earnings, including wages plus allowances and bonuses.

Table 4.7 shows the breakdown of average monthly wages by job function, expressed in US dollar terms using the March 2001 official exchange rate. The same table with values in current Naira is reported in the annex (Table A.13). Over the sample, the monthly salary averaged US\$83.8, while allowances amounted to roughly US\$50 and bonuses were \$8.7. In such a structure of remuneration, allowances are a significant part of total cash earnings for workers (about 35 percent). The total average monthly cash earnings were thus \$142.9. However, as shown by the high value of standard deviations, the dispersion of wages and other benefits is quite large within a function. Moreover, wage differentials are also quite high across functions. Hence, "unskilled" workers (production and service functions) have comparatively much lower

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earnings.¹² Their monthly wage is \$46.5 dollars, their allowances are \$31 dollars and their bonus is \$5.5.

Table 4.7: Monthly Cash Earnings of Workers in US \$ by Job Position

		Wage	Allowance	Bonus
Proprietor	Average Value	265.0	113.2	13.2
	Standard Deviation	(439.2)	(118.5)	(19.7)
	Frequency	29		
Employed Manager	Average Value	179.2	110.8	26.8
	Standard Deviation	(206.6)	(156.1)	(68.4)
	Frequency	227		
Engineer, Scientist,...	Average Value	130.2	74.0	11.7
	Standard Deviation	(88.4)	(54.9)	(18.8)
	Frequency	82		
Economist, Programmers,...	Average Value	136.1	95.3	14.8
	Standard Deviation	(120.4)	(97.0)	(34.9)
	Frequency	44		
Technicians	Average Value	85.6	45.7	5.6
	Standard Deviation	(64.2)	(75.1)	(7.4)
	Frequency	106		
Office and Sales Workers	Average Value	63.2	39.1	5.6
	Standard Deviation	(57.7)	(55.2)	(8.6)
	Frequency	326		
Service Workers	Average Value	43.6	23.0	3.3
	Standard Deviation	(25.4)	(21.1)	(5.7)
	Frequency	159		
Foremen and Supervisors	Average Value	82.3	48.0	5.9
	Standard Deviation	(71.6)	(55.0)	(8.1)
	Frequency	203		
Other Production Workers	Average Value	47.5	33.7	5.3
	Standard Deviation	(32.0)	(32.9)	(12.3)
	Frequency	486		
Machine Maintenance, Repair	Average Value	59.3	34.9	4.0
	Standard Deviation	(94.2)	(23.2)	(8.2)
	Frequency	88		
Health Workers	Average Value	117.1	47.5	13.0
	Standard Deviation	(111.9)	(47.1)	(19.7)
	Frequency	25		
Total	Average Value	83.8	50.5	8.7
	Standard Deviation	(116.5)	(77.4)	(27.8)
	Frequency	1775		

Note:

Computed on the basis of the wages provided by workers in March/April 2001 and converted into US \$ using the march 2001 official exchange rate of 1US \$ = 110 N.

Source: *World Bank, RPED Nigeria, 2001.*

¹² Service workers include cleaners, guards, food preparers, and servers.

This level of wage is slightly below the minimum wage for the private sector, which has been set at US\$50 dollars (or 5500 Naira) per month since the middle of 2000. It is interesting to note that according to the distribution of wages for "unskilled" workers, a majority of them—almost 69 percent—are paid below the new minimum wage. While it may be argued that this result comes from a bias in the sample of workers, it is corroborated by the comments made to us by many of the interviewed firms' managers. Most of them complained about last year's increase, invoking their inability to pay "such an high minimum wage" and also the sudden—almost unilateral—character of the change in the wage legislation. This suggests that the minimum wage legislation is probably a binding constraint on many Nigerian businesses in the formal sector at this time.¹³

Beyond government regulations, there may be other elements that affect the level of remuneration in Nigerian manufacturing, such as constraints on the geographic and/or sectoral mobility of workers, information asymmetries, and other restrictions on hiring and/or dismissal. All these factors contribute to persistent wage differentials and lack of an efficient, competitive labor market. Previous studies on wage determinants in Africa have found that this differential—sometimes large—also exists between various size classes of enterprises, which cannot be explained by other factors. The differential between small and large enterprises exists even after controlling for all firm and worker characteristics. Similarly, foreign firms pay higher wages than domestic companies; and women earn less than men. Overall, wages are higher in Africa than in other similar developing economies (Teal 1996; Mazaheri and Mazumdar 1999; Rama 2000; Azam and Ris 2001).

It is interesting to see how Nigeria compares to other countries. A crude way to assess the existence of earnings differentials is to look at the distribution of the average cash earnings over the sample by sector, size, gender, and ownership. According to Tables 4.8 and A.14, Nigeria is not so different from other African countries. On average, cash earnings for workers increase with firm size, female workers are paid marginally below their male colleagues, and firms with foreign equity provide a better remuneration than their domestic counterparts. Finally, the total cash earnings of workers are the highest in the food/beverage industry and the lowest in wood manufacturing. The sectoral variation is also high. However, a comparison of earnings over all categories of workers is not exempt from methodological pitfalls. Typically, workers are quite heterogeneous, and, without controlling for that fact, comparisons over the entire sample, while informative, do not allow for a clear-cut answer to the question of earnings differentials. A way to minimize this issue is to look at a single type of workers within the same industry. In what follows, the focus is on the wage of "unskilled" production workers because they are most likely to be less heterogeneous than other categories and thus more comparable across firms. Moreover, the level of wage of this category of employees usually serves as a reference for foreign firms when they decide whether or not to invest in a country. Results in US dollar terms are presented below, and the Naira equivalents are reported in Annex Table A.15.

¹³ This result finds some support with the data from the regulations section of the questionnaire. In effect, about 38 percent of the firms quoted the minimum wage as being a problem (moderate or serious).

Table 4.8:
Monthly Cash Earnings of Workers in US \$ by Sector, Size, Gender, & Ownership

		Wage	Allowance	Bonus	Total
		(1)	(2)	(3)	(4)=(1)+(2)+(3)
Sector					
Chemicals/paints		86.7	49.3	7.8	143.8
	<i>Std</i>	(153.36)	(100.60)	(28.99)	
Food/Beverage		113.7	65.5	15.6	194.8
	<i>Std</i>	(123.60)	(102.83)	(38.48)	
Metal		82.9	55.9	9.1	147.9
	<i>Std</i>	(94.85)	(69.71)	(28.22)	
Non-Metal		96.3	76.0	10.1	182.4
	<i>Std</i>	(87.24)	(64.75)	(32.55)	
Paper/Printing/Publishing		59.4	37.9	5.0	102.3
	<i>Std</i>	(47.54)	(45.24)	(14.17)	
Pharmaceuticals		102.8	36.1	10.6	149.5
	<i>Std</i>	(232.62)	(56.53)	(40.23)	
Plastics		72.9	47.3	4.5	124.7
	<i>Std</i>	(66.71)	(94.66)	(7.99)	
Textile		82.6	55.9	9.1	147.7
	<i>Std</i>	(82.71)	(61.01)	(25.64)	
Wood		36.7	23.2	1.3	61.2
	<i>Std</i>	(21.08)	(19.67)	(1.86)	
Sizeclass					
Micro		59.5	35.1	2.8	97.4
	<i>Std</i>	(115.17)	(72.34)	(10.40)	
Small		65.7	41.1	5.4	112.2
	<i>Std</i>	(53.55)	(40.06)	(10.32)	
Medium		86.5	57.3	9.6	153.4
	<i>Std</i>	(100.06)	(66.45)	(30.00)	
Large		95.1	53.8	9.9	158.7
	<i>Std</i>	(123.06)	(63.37)	(33.07)	
Very Large		139.7	77.3	21.1	238.1
	<i>Std</i>	(174.93)	(134.41)	(45.94)	
Gender					
Male		84.9	52.2	9.0	146.0
	<i>Std</i>	(101.31)	(77.55)	(27.16)	
Female		78.9	43.3	7.3	129.5
	<i>Std</i>	(166.58)	(75.25)	(29.91)	
Origin of Ownership					
Firms with Foreign Equity		106.5	64.6	14.3	185.4
	<i>Std</i>	(137.36)	(97.05)	(39.35)	
Pure Local ownership		66.1	40.8	4.1	111.0
	<i>Std</i>	(94.55)	(55.83)	(9.98)	

Note:

Computed on the basis of the wages provided by workers in March/April 2001 and converted into US \$ using the march 2001 official exchange rate of 1US \$ = 110 N.

Source: *World Bank, RPED Nigeria, 2001.*

Table 4.9 confirms that there are wide sectoral differences in wages. With the exception of the non-metal sector, firms with foreign equity provide higher wages for production workers than purely Nigerian firms. The difference can be large. For example, in the wood sector, which provides the lowest remuneration, a production worker earns an average wage of US\$43.8 a month in a Nigerian firm while for the same position in a firm with foreign equity, the average wage is US\$70.7 a month. Again, most of the time, the wage of production workers tends to increase with the size of firms and varies across regions.

Table 4.9: Monthly Wage of Production Workers in US \$ by Ownership, Size, and Sector

1 - By ownership	Firms with Foreign		Pure Local			
		Equity	ownership			
Chemicals/paints		91.2	58.9			
	<i>Std</i>	(25.37)	(28.53)			
Food/Beverage		260.8	56.6			
	<i>Std</i>	(152.59)	(26.92)			
Metal		110.8	75.7			
	<i>Std</i>	(61.36)	(68.03)			
Non-Metal		78.8	111.5			
	<i>Std</i>	na	(90.50)			
Paper/Printing/Publishing		85.6	66.1			
	<i>Std</i>	(23.59)	(38.94)			
Pharmaceuticals		81.9	62.9			
	<i>Std</i>	(28.92)	(31.27)			
Plastics		82.5	51.6			
	<i>Std</i>	(28.42)	(22.14)			
Textile		88.6	70.1			
	<i>Std</i>	(21.87)	(35.78)			
Wood		70.7	43.8			
	<i>Std</i>	(23.34)	(19.60)			
2 - By size		Very Small	Small	Medium	Large	Very Large
Chemicals/paints		46.5	88.8	65.9	94.1	110.3
	<i>Std</i>	(12.79)	(11.52)	(31.65)	(26.81)	(0.00)
Food/Beverage		51.0	43.1	94.1	74.1	286.3
	<i>Std</i>	(22.53)	(25.44)	(38.55)	(23.61)	(148.44)
Metal		72.5	110.9	92.0	75.1	188.6
	<i>Std</i>	(23.78)	(83.05)	(67.29)	(32.02)	(80.91)
Non-Metal		47.5	175.5	78.8	na	na
	<i>Std</i>	na	na	na	na	na
Paper/Printing/Publishing		66.0	85.9	81.8	73.3	na
	<i>Std</i>	(41.68)	(34.58)	(27.07)	(10.70)	na
Pharmaceuticals		31.7	75.0	90.8	37.4	na
	<i>Std</i>	(9.67)	(31.45)	(15.82)	(14.59)	na
Plastics		63.4	54.1	87.9	59.8	66.6
	<i>Std</i>	(23.13)	(28.95)	(43.61)	na	(47.62)
Textile		na	66.8	93.2	81.0	89.0
	<i>Std</i>	na	(37.23)	(31.30)	(14.26)	(16.59)
Wood		45.1	na	na	55.5	na
	<i>Std</i>	(20.37)	na	na	(26.54)	na
3 - By Location		East Region	Lagos and South Region	North Region		
Chemicals/paints		43.5	75.0	62.9		
	<i>Std</i>	(12.01)	(32.21)	(3.30)		
Food/Beverage		128.1	137.6	107.8		
	<i>Std</i>	(117.41)	(157.48)	(48.33)		
Metal		113.8	88.9	98.8		
	<i>Std</i>	(116.92)	(33.12)	(73.51)		
Non-Metal		na	63.1	175.5		
	<i>Std</i>	na	(22.15)	na		
Paper/Printing/Publishing		76.7	73.7	77.8		
	<i>Std</i>	(39.44)	(33.83)	(28.27)		
Pharmaceuticals		25.3	74.1	69.0		
	<i>Std</i>	(1.50)	(33.47)	(24.59)		
Plastics		55.7	73.6	58.0		
	<i>Std</i>	(23.33)	(33.68)	(23.70)		
Textile		78.5	83.9	85.8		
	<i>Std</i>	(51.60)	(15.16)	(23.89)		
Wood		44.6	56.1	37.3		
	<i>Std</i>	(25.11)	(19.75)	(19.69)		

Source: World Bank, RPED Nigeria, 2001.

The data suggest therefore that the issue of earnings differentials cannot be ignored. A more detailed analysis of these wage differentials is done by estimating earnings functions. Some preliminary results are presented in Table 4.10. In these equations, the dependent variable is the

log of the individual net wage, which includes bonuses and various benefits.¹⁴ The exact definition of every exogenous variable is given in Annex A. The various equations, which rank from the simplest possible formulation to more complex ones, test alternate hypotheses. Several theories exist to explain the inter-industry and inter-firms differences in wage schedule observed in many developed and developing economies that are not accounted for by worker's personal characteristics (for a survey of this literature, see Saint-Paul 1998, ch. 5; Azam and Ris 2001). Each are tested in turn.

The first set of arguments, often labeled the "rent-sharing" theory, suggests that wages include a share of the firms profits and are thus a reflection of firm's performance (Blanchflower, Oswald, and Sanfey 1996). This profit element present in worker's compensation may originate in insiders' behavior or various external pressures implying that firms must adjust their incentive system. A second set of theories, a brand of the efficiency-wage theory, states that firms must pay wages above market clearing levels following a simple logic; since the highest penalty that may be inflicted upon a worker is a job loss, the cost to the worker of this loss is made higher by increasing wages so that he will work harder.¹⁵ This implies that firms must have a "monitoring technology" that allows for an assessment the real effort of workers. The final impact on wages depends on the trade-off between paying higher wages and the monitoring costs. A third way of analyzing the issue of wage formation is to rely on the "hold-up" theory (Malcomson 1997). In a framework where labor contracts are open to renegotiation when firms invest in specific assets and are unable to negotiate complete labor contracts with their workers, a new investment opens the possibility for workers to renegotiate the wage agreement.¹⁶ In this case, workers can get a share of the surplus generated by the new investment, depending on their bargaining power.

The starting point of the analysis is the estimation of a simple wage equation related to the individual characteristics of the workers, which results are reported in Equations (1) and (2) (Mincer 1974). It is therefore assumed that employers are able to discover the differences in productivity between workers, depending on their level of human capital, origin, experience and other characteristics. Equation (2) differs from Equation (1) only by the inclusion of sectoral dummies.¹⁷ The usual variables that account for human capital—the number of years of education, firm tenure, the work experience outside the firm (in years)—all have the expected influence and are statistically significant. In other words, the higher the endowment in human capital of an individual worker, the higher his wage. This prediction is not altered by the

¹⁴ Equations have been estimated using two-stage least squares, the education variable being instrumented in order to take into account its potential endogeneity, likely to be caused by the simultaneous impact of the worker's unobserved abilities on both the earnings and the educational achievement. In addition, White's consistent *t* ratio is reported in the table to correct for the eventual heteroscedasticity in the data.

¹⁵ We refer here to the Shapiro-Stiglitz model of efficiency wage (Shapiro-Stiglitz 1984).

¹⁶ Were the firms able to negotiate complete contract (i.e., which envision every possibility), then the "hold-up" issue would be pointless. In such a case, an initial wage negotiation would consider every possibility—including the case of the specific investment—and the wage rate would not be affected ex-post.

¹⁷ These sectoral dummies have not been reported in the table for ease of reading. They are all significant at the 1 percent level with the exception of the dummy for the paper/printing/publishing industry, which is significant at the 10 percent level.

Table 4.10. Determinants of Wage-Earnings.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	7.5183 (40.664) ***	7.2269 (39.140) ***	7.4069 (33.412) ***	5.9817 (19.674) ***	7.3332 (31.659) ***	7.3935 (33.515) ***	5.7934 (18.562) ***
Workers Characteristics							
Education	0.0657 (6.017) ***	0.0609 (5.627) ***	0.0473 (3.563) ***	0.0525 (4.222) ***	0.0512 (3.858) ***	0.0515 (3.939) ***	0.0530 (4.233) ***
Experience with Firm	0.0625 (8.066) ***	0.0605 (8.128) ***	0.0266 (4.600) ***	0.0257 (7.428) ***	0.0301 (8.606) ***	0.0307 (8.873) ***	0.0257 (7.439) ***
Experience ²	-0.0009 (-3.264) **	-0.0009 (-3.461) ***	0.0228 (0.691) ns	-	-	-	-
Other prof. experience	0.0268 (7.445) ***	0.0264 (7.503) ***	0.0259 (6.491) ***	0.0263 (6.947) ***	0.0265 (6.833) ***	0.0275 (7.036) ***	0.0269 (7.119) ***
Non African worker	0.3058 (1.090) ns	0.4126 (1.497) ns	0.4305 (1.647) *	0.3213 (1.255) ns	0.4380 (1.656) **	0.4122 (1.568) ns	0.3522 (1.362) ns
Gender	0.0688 (1.523) ns	0.0762 (1.727) *	0.0491 (1.001) ns	-	-	-	-
Weekly hours worked	0.0042 (2.721) **	0.0043 (2.527) **	0.0070 (2.990) **	0.0059 (2.750) ***	0.0071 (3.091) ***	0.0066 (2.911) **	0.0051 (2.364) **
Trained	0.2536 (6.610) ***	0.2380 (6.324) ***	0.2137 (5.065) ***	0.1652 (4.150) ***	0.2154 (5.110) ***	0.1988 (4.617) ***	0.1580 (3.973) ***
Sector dummies							
	No	Yes	Yes	Yes	Yes	Yes	Yes
Firms Characteristics							
Age of the Firm	-	-	-0.0003 (-2.604) ***	-0.0003 (-2.217) **	-0.0003 (-2.451) **	-0.0003 (-2.372) **	-0.0002 (-1.908) *
Foreign Ownership	-	-	0.3727 (9.095) ***	0.2402 (5.717) ***	0.3607 (8.934) ***	0.3504 (8.206) ***	0.2118 (4.918) ***
Firm in the Lagos/South	-	-	0.0162 (0.425) ns	-	-	-	-
Product-Market Effect							
Log Profit per Worker	-	-	-	0.0734 (3.360) ***	-	-	0.0794 (3.538) ***
Internal Pressure							
Union in Firm	-	-	-	0.3153 (6.656) ***	-	-	0.3065 (6.239) ***
Permanent worker	-	-	-	0.6392 (4.894) ***	-	-	0.6362 (4.859) ***
External Pressure							
Log employm. change	-	-	-	0.0820 (7.463) ***	-	-	0.0893 (7.584) ***
Efficiency Wage Theory							
Supervision	-	-	-	-	0.4702 (1.866) *	-	0.5819 (2.408) **
Complexity	-	-	-	-	0.1160 (2.266) **	-	0.0790 (1.520) ns
Turnover	-	-	-	-	-0.0214 (-0.295) ns	-	0.0215 (0.305) ns
Hold-Up Theory							
Specific Investment	-	-	-	-	-	0.0076 (2.676) ***	0.0066 (2.400) **
R-squared	0.308	0.345	0.412	0.455	0.415	0.416	0.463
F-statistic	59.931	38.391	31.705	38.817	32.111	36.031	33.269
N	1,575	1,575	1,106	1,106	1,106	1,106	1,106

Significance levels: *** 1 %; ** 5 %; * 10 %

Dependent Variable: Log of Net Earnings (Net earnings= sum of individual wage, allowance and bonus on a monthly basis)

Method: Two-Stage Least Squares - Education variable instrumented.

inclusion of sectoral dummies. The influence of the training of the worker in the course of his professional activity is also positive and significant, whether in Equation (1) or (2). This is also the case for the duration of work variable, capturing tenure.

Interestingly, the results for the origin of the workers (the "Non-African Worker" dummy variable) and for "Gender" are ambiguous. In Regressions (1) and (2), the origin of worker is non-significant, which suggests that there is no evidence of wage discrimination, nor any special benefit to be a non-African worker in Nigerian manufacturing. However, it is difficult to obtain a final answer on the issue as in other regressions, as the variable is sometimes significant. A similar issue arises with the "Gender" variable, which sometimes signals that there is a benefit to be a male worker. These results are not robust.

The inclusion of firm-specific variables does not fundamentally change the positive influence of human capital on wage, with the exception of the square of years of experience, which loses significance as depicted in Equation (3). Training and the number of hours worked remains highly significant. Firm level variables like the "Age of the Firm" and "Foreign Ownership" matter. Belonging to a foreign firm entails a statistically significant higher wage, which is consistent with the literature. Interestingly, it does not seem that the geographical factor has a significant influence on wages. The "Lagos/South" dummy is not significant. It must be noted that the "Age of the Firm" and "Foreign Ownership" variables turn out significant in every equation in which they are included. This suggests that a purely competitive model is not relevant for explaining the process of wage formation in Nigerian manufacturing, because if it were valid no firm specific variable would matter.

In addition to these basic factors, we examine the incremental impact of additional variables to assess for the relevance of rent-sharing, efficiency wage, and specific investment effects. Results are reported in Equations (4) to (6).

Equation (4) is an attempt at testing both the direct rent-sharing effect by including the profit per worker and the origin of the phenomenon, which can be traced back to internal/external pressures on the firm. Internal pressures are represented by a dummy variable that accounts for the existence of unions inside the firm and a variable related to the presence of permanent workers. The external pressure variable is the "employment change," which is the average value of firing made by firms in the same sector of activity. This variable accounts for tensions on the labor market. Every variable that aims at capturing the rent-sharing effect and the pressures on the firm is significant. As expected, there is a positive correlation between the profit per workers and the wages.

Results indicate that the bargaining power of workers in Nigeria cannot be underestimated, as signaled by the strong significance of the "Union in Firm" and "Permanent Worker" variables. In Nigeria, the rationale for a rent-sharing effect can be traced back to the power workers derive from the recurrent infrastructure problems that plague the manufacturing sector. Every worker has a credible bargaining power because even his/her smallest action can stop the production process in this context.

The test of efficiency-wage theories examined in Equation (5) relies on a different logic. In shirking models, firms use high wages to increase the value of the threat of firing. In this framework, it is possible to assume that the monitoring "technology," which assesses the effort of

workers, is endogenous to the firm. In other words, the probability of being caught shirking is positively related to the ratio of management and supervisory staff to the total number of workers. Azam and Lesueur (1997) show that in this case, this ratio affects negatively the wage paid by firms as firms trade off between higher wages and supervision costs. The variable "Supervision" aims at capturing this effect. It is defined as the share of managers and supervisors/foremen in the total workforce. While significant—but only marginally—this variable has the wrong sign. Two other interesting variables that test for the relevance of an efficiency wage mechanism in Nigerian manufacturing are the "Complexity" variable (computed as the share of foreign technicians/engineers in firm's employment) and the "Turnover" variable. The former variable is a proxy for the complexity of the production process. In the efficiency-wage framework, using more complex production technologies makes the monitoring of worker's activity more costly, which induces firms to pay higher wages. Interestingly, there is a positive significant correlation of this variable with wages. The "Turnover" variable is defined as the ratio of the number of workers fired, hired, or quitting (retirement, illness, other opportunities) to the total workforce. This variable is non-significant. Thus, the evidence on the relevance of efficiency-wage mechanism in Nigerian manufacturing is quite mixed. Only the "Complexity" variable is significant with the correct sign. As we shall see, this result is reinforced by the last regression.

Last, before assessing the joint impact of all factors determining wages, we turn to the test of the "hold-up" theory. This theory states that if incomplete labor contracts are open to renegotiation, workers are able to capture—to make a hold-up—on the surplus generated by a firm's specific investment. The possibility of contract renegotiation holds only if the investment is irreversible or reversible only at a very high cost for the firm. The variable used to test for this effect is the last investment made by Nigerian firms in equipment, under the assumption that such an investment is specific enough. The test is performed in Equation (6). This variable has a positive significant correlation with wages. This result further strengthens the case of the power of workers inside firms.

Equation (7) presents the final specification of the various mechanisms, by testing all of them jointly. Again, variables for human capital, training, and hours worked are highly significant with the expected signs. Institutional variables such as the age of firms and their type of ownership are still significant. In terms of which mechanism of wage determination is likely to have an impact in Nigeria, Equation (7) provides a striking result. In effect, while rent-sharing variables and variables for specific investment remain significant with the expected signs, the variables linked to efficiency-wage theory lose their explanatory power. The "Complexity" variable is not significant anymore and the "Turnover" variable is still not significant. The only significant variable ("Supervision") has the wrong sign and cannot be justified in an efficiency-wage framework.

This final regression strongly suggests that the main force driving wages in Nigeria, besides the endowment in human capital of the employees, is the bargaining power of the workers, which is likely to come from the influence of unions and the dominance of permanent employment. More detailed econometric work will be conducted to reaffirm these findings.

Conclusion

This section outlined the main characteristics of the manufacturing labor market in Nigeria. The first striking finding is that overall employment in manufacturing has declined over the last decade. However, not all firms have reduced employment. Firms in the smaller size categories have added employees, while larger firms have shrunk. Another interesting fact is that the distribution of employment remains quite uneven across regions and sectors. The manufacturing industry is dominated by the Lagos area and the textile and food/beverage sectors.

According to the data, the Nigerian workforce is middle-aged, with higher human capital compared to workers in other Sub-Saharan African countries, and remains divided along ethnic lines.

It is often argued that wages are high in western Africa by the standards of low-income countries. In such a situation, understanding the mechanism behind the formation of wages in manufacturing becomes crucial. It seems that the high share of white-collar workers in the total workforce may account for part of the problem. However, this is just a descriptive element that tells nothing about the underlying determinant of wages. Preliminary econometric results suggest that wages in Nigeria mainly depend on human capital variables, some specific firm characteristics, and a set of variables that account both for a mix of rent-sharing and a hold-up mechanism. In this type of framework, firms must share or give up a part of their profit in response to various pressures, either internal to the firm or sectoral. The fact that most of the labor contracts are permanent and that unions are relatively strong can explain to some extent the existence of pressures inside the firms. Interestingly, it does not seem that efficiency-wage type of theories make any difference in the Nigerian context.

It therefore seems that the labor market in Nigeria is far from being integrated. Moreover, any attempt at containing wage growth in the manufacturing sector should focus first on the role of unions and the bargaining power of workers. In the Nigerian context, infrastructure issues make it such that every single worker has a possibility of stopping production at will. They are thus a factor in any intra-firm wage negotiation. The erstwhile result of this is that improving the infrastructure of the country might provide, quite unexpectedly, a way to moderate the growth of wages in the medium term, which would help regain or maintain competitiveness.

Annex A: Detailed Labor Market Tables

Table A.1: Permanent Full-Time Employees by Sectors and Size Class in 2000

	Very Small		Small		Medium		Large		Very Large		Total	
	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.
Chemicals/paints	213	3.3	151	2.3	927	14.2	1 631	25.0	3 591	55.1	6 513	100.0
<i>C.Pct</i>	<i>12.3</i>		<i>4.6</i>		<i>12.9</i>		<i>13.3</i>		<i>7.7</i>		<i>9.2</i>	
Food/Beverage	140	1.0	424	3.1	1 238	8.9	2 175	15.7	9 876	71.3	13 853	100.0
<i>C.Pct</i>	<i>8.1</i>		<i>12.8</i>		<i>17.2</i>		<i>17.7</i>		<i>21.2</i>		<i>19.5</i>	
Metal	247	3.0	849	10.4	1 668	20.3	2 783	33.9	2 654	32.4	8 201	100.0
<i>C.Pct</i>	<i>14.3</i>		<i>25.7</i>		<i>23.2</i>		<i>22.6</i>		<i>5.7</i>		<i>11.5</i>	
Non-Metal	71	13.9	98	19.2	342	66.9	0	0.0	0	0.0	511	100.0
<i>C.Pct</i>	<i>4.1</i>		<i>3.0</i>		<i>4.8</i>		<i>0.0</i>		<i>0.0</i>		<i>0.7</i>	
Paper/Printing/Publishing	351	13.2	429	16.2	570	21.5	1 301	49.1	0	0.0	2 651	100.0
<i>C.Pct</i>	<i>20.3</i>		<i>13.0</i>		<i>7.9</i>		<i>10.6</i>		<i>0.0</i>		<i>3.7</i>	
Pharmaceuticals	164	2.2	422	5.8	589	8.0	1 182	16.2	4 961	67.8	7 318	100.0
<i>C.Pct</i>	<i>9.5</i>		<i>12.8</i>		<i>8.2</i>		<i>9.6</i>		<i>10.6</i>		<i>10.3</i>	
Plastics	328	7.6	393	9.1	1 020	23.6	1 236	28.6	1 352	31.2	4 329	100.0
<i>C.Pct</i>	<i>19.0</i>		<i>11.9</i>		<i>14.2</i>		<i>10.1</i>		<i>2.9</i>		<i>6.1</i>	
Textile	0	0.0	539	2.0	823	3.0	1 517	5.6	24 160	89.4	27 039	100.0
<i>C.Pct</i>	<i>0.0</i>		<i>16.3</i>		<i>11.5</i>		<i>12.3</i>		<i>51.9</i>		<i>38.0</i>	
Wood	215	31.6	0	0.0	0	0.0	465	68.4	0	0.0	680	100.0
<i>C.Pct</i>	<i>12.4</i>		<i>0.0</i>		<i>0.0</i>		<i>3.8</i>		<i>0.0</i>		<i>1.0</i>	
Total	1 729	2.4	3 305	4.6	7 177	10.1	12 290	17.3	46 594	65.5	71 095	100.0
<i>C.Pct</i>	<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>	

Source: World Bank, RPED Nigeria, 2001.

Table A.2: Permanent Full-Time Employees by Regions and Size Class in 2000

	Very Small		Small		Medium		Large		Very Large		Total	
	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.	Nber.	R.Pct.
East Region	353	3.3	740	7.0	1555	14.7	2 772	26.2	5 168	48.8	10 588	100.0
<i>C.Pct</i>	<i>20.4</i>		<i>22.4</i>		<i>21.7</i>		<i>22.6</i>		<i>11.1</i>		<i>14.9</i>	
Lagos and South Region	1018	2.5	1679	4.0	4 017	9.7	6 841	16.5	27 924	67.3	41 479	100.0
<i>C.Pct</i>	<i>58.9</i>		<i>50.8</i>		<i>56.0</i>		<i>55.7</i>		<i>59.9</i>		<i>58.3</i>	
North Region	358	1.9	886	4.7	1 605	8.4	2 677	14.1	13 502	71.0	19 028	100.0
<i>C.Pct</i>	<i>20.7</i>		<i>26.8</i>		<i>22.4</i>		<i>21.8</i>		<i>29.0</i>		<i>26.8</i>	
Total	1 729	2.4	3 305	4.6	7 177	10.1	12 290	17.3	46 594	65.5	71 095	100.0
<i>C.Pct</i>	<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>		<i>100.0</i>	

Source: World Bank, RPED Nigeria, 2001.

Table A.3: Structure of Employment by Job Position and Sectors as of April 2001

Function	Chemicals/paints		Food/Beverage		Metal		Non-Metal		Paper/Printing/Publishing		Pharmaceuticals		Plastics		Textile		Wood		Total	
	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.	Nbr.	R.Pct.
Proprietors	31	11.6	42	15.7	51	19.1	9	3.4	26	9.7	20	7.5	35	13.1	39	14.6	14	5.2	267	100.0
<i>C.Pct</i>	0.5		0.3		0.6		1.8		1.0		1.1		0.9		0.1		1.6		0.4	
Employed Managers	484	15.9	997	32.9	409	13.5	36	1.2	190	6.3	181	6.0	173	5.7	533	17.6	32	1.1	3 035	100.0
<i>C.Pct</i>	7.0		7.0		4.8		7.1		7.2		9.6		4.3		2.0		3.7		4.6	
Engineers, scientists	169	15.8	392	36.6	137	12.8	9	0.8	37	3.5	55	5.1	119	11.1	147	13.7	7	0.7	1 072	100.0
<i>C.Pct</i>	2.5		2.8		1.6		1.8		1.4		2.9		3.0		0.6		0.8		1.6	
Economists, programmers, ...	164	14.1	638	54.8	91	7.8	5	0.4	34	2.9	73	6.3	64	5.5	85	7.3	11	0.9	1 165	100.0
<i>C.Pct</i>	2.4		4.5		1.1		1.0		1.3		3.9		1.6		0.3		1.3		1.8	
Technicians	312	8.9	1093	31.1	507	14.4	10	0.3	164	4.7	148	4.2	167	4.8	1088	31.0	20	0.6	3 509	100.0
<i>C.Pct</i>	4.5		7.7		5.9		2.0		6.2		7.9		4.2		4.2		2.3		5.4	
Office and Sales Workers	768	12.5	2042	33.2	725	11.8	57	0.9	280	4.6	365	5.9	274	4.5	1586	25.8	55	0.9	6 152	100.0
<i>C.Pct</i>	11.2		14.4		8.5		11.2		10.6		19.4		6.8		6.1		6.3		9.4	
Service Workers	491	8.5	1503	26.1	864	15.0	103	1.8	296	5.1	221	3.8	321	5.6	1906	33.1	49	0.9	5 754	100.0
<i>C.Pct</i>	7.2		10.6		10.1		20.3		11.2		11.8		8.0		7.3		5.6		8.8	
Foremen and Supervisors	556	13.4	1028	24.8	534	12.9	22	0.5	194	4.7	104	2.5	208	5.0	1459	35.2	39	0.9	4 144	100.0
<i>C.Pct</i>	8.1		7.2		6.3		4.3		7.3		5.5		5.2		5.6		4.5		6.3	
Other Production Workers	3 585	9.9	4840	13.4	4667	12.9	226	0.6	1 272	3.5	637	1.8	2392	6.6	17928	49.6	628	1.7	36 175	100.0
<i>C.Pct</i>	52.2		34.1		54.8		44.6		48.0		33.9		59.7		68.8		71.9		55.2	
Machine Maintenance & Repa	306	7.1	1629	38.0	539	12.6	30	0.7	158	3.7	75	1.7	252	5.9	1280	29.9	19	0.4	4 288	100.0
<i>C.Pct</i>	4.5		11.5		6.3		5.9		6.0		4.0		6.3		4.9		2.2		6.5	
Total Perm Empl.	6 866	10.5	14 204	21.7	8 524	13.0	507	0.8	2 651	4.0	1 879	2.9	4 005	6.1	26 051	39.7	874	1.3	65 561	100.0
%	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	

Source: World Bank, RPED Nigeria, 2001.

Table A.4: Type of Employment by Sector and Size Class (C.Pct)

		Very Small	Small	Medium	Large	Very Large	Total
Chemicals/paints	Full-Time (Permanent) worker	99.1	100.0	80.2	84.3	80.7	82.5
	Full-Time (Casual) worker	0.9	0.0	19.8	15.7	19.3	17.5
	Part-Time worker	0.0	0.0	0.0	0.0	0.0	0.0
Food/Beverage	Full-Time (Permanent) worker	95.9	89.4	92.3	88.7	80.5	83.0
	Full-Time (Casual) worker	4.1	10.6	7.3	9.0	16.8	14.7
	Part-Time worker	0.0	0.0	0.4	2.3	2.7	2.3
Metal	Full-Time (Permanent) worker	91.0	77.7	73.6	93.0	99.3	89.4
	Full-Time (Casual) worker	9.0	22.1	25.8	4.5	0.7	9.6
	Part-Time worker	0.0	0.2	0.6	2.4	0.0	0.9
Non-Metal	Full-Time (Permanent) worker	100.0	52.7	100.0	nc	nc	86.5
	Full-Time (Casual) worker	0.0	47.3	0.0	nc	nc	13.5
	Part-Time worker	0.0	0.0	0.0	nc	nc	0.0
Paper/Printing/...	Full-Time (Permanent) worker	85.5	45.4	69.0	75.0	nc	66.3
	Full-Time (Casual) worker	14.5	14.6	27.0	25.0	nc	21.4
	Part-Time worker	0.0	40.0	3.9	0.0	nc	12.3
Pharmaceuticals	Full-Time (Permanent) worker	74.3	70.7	90.8	78.2	100.0	93.0
	Full-Time (Casual) worker	25.7	25.4	8.2	21.8	0.0	6.6
	Part-Time worker	0.0	3.9	1.0	0.0	0.0	0.4
Plastics	Full-Time (Permanent) worker	78.1	74.2	84.3	80.2	94.9	85.1
	Full-Time (Casual) worker	21.9	25.8	15.0	15.4	5.1	13.6
	Part-Time worker	0.0	0.0	0.8	4.3	0.0	1.2
Textile	Full-Time (Permanent) worker	nc	90.1	85.0	93.4	97.7	96.9
	Full-Time (Casual) worker	nc	9.7	15.0	6.6	2.3	3.1
	Part-Time worker	nc	0.2	0.0	0.0	0.0	0.0
Wood	Full-Time (Permanent) worker	86.1	nc	nc	100.0	nc	95.9
	Full-Time (Casual) worker	11.7	nc	nc	0.0	nc	3.4
	Part-Time worker	2.3	nc	nc	0.0	nc	0.7
Full-Time (Permanent) worker		86.7	71.4	82.4	86.9	92.5	89.2
Full-Time (Casual) worker		12.9	18.6	16.8	11.7	6.9	9.5
Part-Time worker		0.3	10.0	0.7	1.3	0.7	1.3

Source: World Bank, RPED Nigeria, 2001.

Table A.5: Peak Season by Sector

	Percentage of Firms with a Peak Season	Average Duration of the Peak Season (Nber of Months)	Pct of firms in Peak Season at time of the Survey*	Average Nber of Extra-Workers	
				Full-Time	Part-Time
Chemicals/paints	84.0	4.4	0.0	1.1	29.5
Food/Beverage	79.4	4.8	29.6	27.0	3.9
Metal	45.5	4.7	45.0	2.5	9.1
Non-Metal	60.0	5.7	33.3	17.3	0.7
Paper/Printing/Publishing	70.4	4.7	15.8	0.6	9.1
Pharmaceuticals	42.9	3.2	0.0	7.8	3.3
Plastics	57.1	5.1	37.5	1.3	5.9
Textile	54.5	4.7	16.7	2.8	24.4
Wood	55.6	4.2	40.0	11.0	0.0
Total	61.1	4.6	23.2	7.7	11.9

* March-April 2001

Source: World Bank, RPED Nigeria, 2001.

Table A.6: Average Age of Employees per Size Class of Firms and Gender in Years

	Very Small	Small	Medium	Large	Very Large
Male	35.2	37.1	36.9	37.8	39.1
Female	30.2	29.0	31.4	32.9	35.7
Total	34.3	35.6	35.8	36.7	38.6

Source: *RPED Nigeria 2001*

Table A.7: Average Age of Employees by Job Position and Gender (No. of Years)

	Male	Female	Total
01 - Proprietor	42.4	43.0	42.5
02 - Employed Manager	41.5	37.3	41.1
03 - Engineer, Scientist,...	37.6	29.9	36.9
04 - Economist, Programmers,...	37.1	37.6	37.2
05 - Technicians	37.9	26.5	37.7
06 - Office and Sales Workers	36.2	29.3	33.0
07 - Service Workers	40.7	31.7	38.9
08 - Foremen and Supervisors	38.4	34.2	38.1
09 - Other Production Workers	33.0	29.4	32.4
10 - Machine Maintenance and Repair	35.1	40.0	35.1
11 - Health Workers	42.9	40.1	40.9
Total	37.0	31.3	35.9

Source: *RPED Nigeria 2001*

Table A.8: Average Seniority in Firms by Gender and Job Position (No. of Years)

	Male	Female	Total
01 - Proprietor	6.9	12.8	8.4
02 - Employed Manager	8.8	6.7	8.6
03 - Engineer, Scientist,...	6.4	3.2	6.1
04 - Economist, Programmers,...	6.1	8.3	6.6
05 - Technicians	8.9	1.8	8.8
06 - Office and Sales Workers	7.6	4.8	6.3
07 - Service Workers	6.3	6.0	6.2
08 - Foremen and Supervisors	10.4	9.5	10.4
09 - Other Production Workers	6.9	7.2	7.0
10 - Machine Maintenance and Repair	7.3	8.0	7.3
11 - Health Workers	6.3	6.9	6.7
Total	7.8	6.1	7.5

Source: *RPED Nigeria 2001*

Table A.9: Average Work Experience before Working for the Current Firm (No. of Years)

	Male	Female	Total
01 - Proprietor	10.8	7.5	10.0
02 - Employed Manager	8.2	5.4	8.0
03 - Engineer, Scientist,...	7.3	1.6	6.7
04 - Economist, Programmers,...	4.8	4.3	4.7
05 - Technicians	6.1	3.0	6.0
06 - Office and Sales Workers	4.7	2.6	3.8
07 - Service Workers	9.4	2.7	8.1
08 - Foremen and Supervisors	5.3	2.4	5.1
09 - Other Production Workers	3.3	1.0	3.0
10 - Machine Maintenance and Repair	4.6	0.0	4.5
11 - Health Workers	7.7	11.3	10.3
Total	5.6	3.0	5.2

Source: *RPED Nigeria 2001*.

Table A.10: Training of Workers by Sector, Gender, and Size of the Firm (R.Pct)

Sector	Within the	Outside the	Both	No	Gender	Within the	Outside the	Both	No	Sizeclass	Within the	Outside the	Both	No
	Firm	Firm				Firm	Firm				Firm	Firm		
Chemicals/paints	5.6	7.6	1.5	85.4	Male	10.1	6.5	1.4	82.0	Very Small	4.0	2.9	0.7	92.5
Food/Beverage	11.3	5.8	4.7	78.2	Female	8.7	3.9	1.5	85.8	Small	4.9	6.6	0.0	88.5
Metal	15.4	5.7	0.8	78.0						Medium	10.3	6.9	0.7	82.1
Non-Metal	2.4	7.3	0.0	90.2						Large	16.1	7.4	0.6	75.8
Paper/Printing/Publishing	9.6	4.1	0.0	86.2						Very Large	19.7	7.9	7.1	65.3
Pharmaceuticals	6.8	3.4	1.4	88.4										
Plastics	7.1	10.7	0.5	81.6										
Textile	11.1	5.9	1.5	81.5										
Wood	2.5	2.5	0.0	94.9										
					Total	9.9	6.0	1.4	82.7					

Source: World Bank, RPED Nigeria, 2001.

Table A.11: On the Results of Training (R.Pct)

1 - Percentage of workers who received a wage increase after their training.						
<i>Sector</i>			<i>Gender</i>		<i>Sizeclass</i>	
	Chemicals/paints	3.1	Male	14.9	Very Small	20.7
	Food/Beverage	11.8	Female	8.1	Small	22.4
	Metal	15.8	Total	13.9	Medium	7.8
	Non-Metal	50.0			Large	9.7
	Paper/Printing/Publishing	19.0			Very Large	12.1
	Pharmaceuticals	4.4				
	Plastics	23.5				
	Textile	15.6				
	Wood	14.3				
2 - Percentage of workers who got a higher position and had training in the past.						
<i>Sector</i>			<i>Gender</i>		<i>Sizeclass</i>	
	Chemicals/paints	56.7	Male	46.6	Very Small	26.0
	Food/Beverage	58.3	Female	50.0	Small	46.2
	Metal	50.5	Total	46.9	Medium	47.8
	Non-Metal	10.0			Large	58.6
	Paper/Printing/Publishing	38.8			Very Large	57.3
	Pharmaceuticals	51.5				
	Plastics	26.3				
	Textile	49.3				
	Wood	41.2				

Source: World Bank, RPED Nigeria, 2001.

Table A.12: Distribution of Interviewed Employees by Ethnic Origin and Job Position

	Hausa		Igbo		Yoruba		European		Indian		Middle-East		Other		Total	
	Nber	R.pct	Nber	R.pct	Nber	R.pct	Nber	R.pct	Nber	R.pct	Nber	R.pct	Nber	R.pct	Nber	R.pct
01 - Proprietor	8	27.6	8	27.6	5	17.2	0	0.0	0	0.0	1	3.4	7	24.1	29	100.0
<i>C.Pct</i>	5.0		1.6		0.7		0.0		0.0		14.3		1.6		1.6	
02 - Employed Manager	20	8.8	68	30.0	90	39.6	0	0.0	3	1.3	1	0.4	45	19.8	227	100.0
<i>C.Pct</i>	12.6		14.0		13.1		0.0		60.0		14.3		10.5		12.8	
03 - Engineer, Scientist,...	9	11.0	27	32.9	28	34.1	0	0.0	1	1.2	0	0.0	17	20.7	82	100.0
<i>C.Pct</i>	5.7		5.5		4.1		0.0		20.0		0.0		4.0		4.6	
04 - Economist, Programmers,...	2	4.5	15	34.1	14	31.8	0	0.0	0	0.0	0	0.0	13	29.5	44	100.0
<i>C.Pct</i>	1.3		3.1		2.0		0.0		0.0		0.0		3.0		2.5	
05 - Technicians	6	5.7	22	20.8	57	53.8	0	0.0	1	0.9	0	0.0	20	18.9	106	100.0
<i>C.Pct</i>	3.8		4.5		8.3		0.0		20.0		0.0		4.7		6.0	
06 - Office and Sales Workers	17	5.2	105	32.2	129	39.6	1	0.3	0	0.0	2	0.6	72	22.1	326	100.0
<i>C.Pct</i>	10.7		21.6		18.8		100.0		0.0		28.6		16.8		18.4	
07 - Service Workers	30	18.9	36	22.6	51	32.1	0	0.0	0	0.0	1	0.6	41	25.8	159	100.0
<i>C.Pct</i>	18.9		7.4		7.4		0.0		0.0		14.3		9.6		9.0	
08 - Foremen and Supervisors	16	7.9	51	25.1	76	37.4	0	0.0	0	0.0	0	0.0	60	29.6	203	100.0
<i>C.Pct</i>	10.1		10.5		11.0		0.0		0.0		0.0		14.0		11.4	
09 - Other Production Workers	44	9.1	131	27.0	199	40.9	0	0.0	0	0.0	1	0.2	111	22.8	486	100.0
<i>C.Pct</i>	27.7		26.9		28.9		0.0		0.0		14.3		25.9		27.4	
10 - Machine Maintenance and Repair	6	6.8	17	19.3	30	34.1	0	0.0	0	0.0	1	1.1	34	38.6	88	100.0
<i>C.Pct</i>	3.8		3.5		4.4		0.0		0.0		14.3		7.9		5.0	
11 - Health Workers	1	4.0	7	28.0	9	36.0	0	0.0	0	0.0	0	0.0	8	32.0	25	100.0
<i>C.Pct</i>	0.6		1.4		1.3		0.0		0.0		0.0		1.9		1.4	
Total	159	9.0	487	27.4	688	38.8	1	0.1	5	0.3	7	0.4	428	24.1	1775	100.0
	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	

Source: World Bank, RPED Nigeria, 2001.

Table A.13: Wages, Allowances, and Bonuses in Naira per Month by Job Position

		Wage	Allowance	Bonus
Proprietor	Average Value	29 155.1	12 449.3	1 447.5
	Standard Deviation	(48 306.9)	(13 034.7)	(2 162.8)
	Frequency	29		
Employed Manager	Average Value	19 717.0	12 184.8	2 950.1
	Standard Deviation	(22 722.8)	(17 169.3)	(7 523.1)
	Frequency	227		
Engineer, Scientist,...	Average Value	14 322.1	8 139.2	1 290.0
	Standard Deviation	(9 728.6)	(6 042.0)	(2 064.2)
	Frequency	82		
Economist, Programmers,...	Average Value	14 971.2	10 480.2	1 626.7
	Standard Deviation	(13 249.4)	(10 673.8)	(3 841.8)
	Frequency	44		
Technicians	Average Value	9 410.8	5 029.8	615.1
	Standard Deviation	(7 058.6)	(8 262.2)	(812.4)
	Frequency	106		
Office and Sales Workers	Average Value	6 957.5	4 304.5	620.7
	Standard Deviation	(6 343.1)	(6 070.2)	(945.3)
	Frequency	326		
Service Workers	Average Value	4 793.7	2 532.1	362.8
	Standard Deviation	(2 794.7)	(2 326.4)	(629.9)
	Frequency	159		
Foremen and Supervisors	Average Value	9 057.1	5 282.0	649.6
	Standard Deviation	(7 879.0)	(6 048.7)	(889.7)
	Frequency	203		
Other Production Workers	Average Value	5 225.1	3 701.5	578.7
	Standard Deviation	(3 519.5)	(3 622.2)	(1 350.2)
	Frequency	486		
Machine Maintenance and Repair	Average Value	6 528.0	3 834.9	441.6
	Standard Deviation	(10 365.9)	(2 554.5)	(900.9)
	Frequency	88		
Health Workers	Average Value	12 883.4	5 229.5	1 425.9
	Standard Deviation	(12 304.6)	(5 185.0)	(2 163.2)
	Frequency	25		
Total	Average Value	9 212.8	5 555.1	953.9
	Standard Deviation	(12 819.6)	(8 510.5)	(3 053.7)
	Frequency	1775		

Source: World Bank, RPED Nigeria 2001.

Table A.14:
Wages, Allowances, and Bonuses in Naira per Month
by Sector, Size, Gender, and Origin of Ownership

		Wage (1)	Allowance (2)	Bonus (3)	Total (4)=(1)+(2)+(3)	Ratios to Wages (2)/(1) (3)/(1)	
Sector							
Chemicals/paints		9 540.6	5 422.4	852.9	15 815.9	0.57	0.09
	<i>Std</i>	(16 869.81)	(11 066.41)	(3 188.75)			
Food/Beverage		12 503.4	7 205.8	1 720.6	21 429.8	0.58	0.14
	<i>Std</i>	(13 595.78)	(11 311.75)	(4 232.28)			
Metal		9 122.0	6 148.4	1 001.0	16 271.4	0.67	0.11
	<i>Std</i>	(10 433.10)	(7 668.35)	(3 103.69)			
Non-Metal		10 593.3	8 358.4	1 110.9	20 062.6	0.79	0.10
	<i>Std</i>	(9 595.94)	(7 122.32)	(3 580.63)			
Paper/Printing/Publishing		6 531.7	4 165.8	552.4	11 249.9	0.64	0.08
	<i>Std</i>	(5 229.63)	(4 976.77)	(1 558.41)			
Pharmaceuticals		11 309.9	3 972.9	1 165.4	16 448.2	0.35	0.10
	<i>Std</i>	(25 588.47)	(6 218.41)	(4 425.18)			
Plastics		8 016.8	5 207.7	494.1	13 718.7	0.65	0.06
	<i>Std</i>	(7 338.23)	(10 412.37)	(878.40)			
Textile		9 086.9	6 154.4	1 006.5	16 247.8	0.68	0.11
	<i>Std</i>	(9 097.83)	(6 711.27)	(2 820.05)			
Wood		4 036.8	2 557.2	141.6	6 735.6	0.63	0.04
	<i>Std</i>	(2 318.71)	(2 164.11)	(204.10)			
Sizeclass							
Micro		6 543.0	3 857.8	308.3	10 709.1	0.59	0.05
	<i>Std</i>	(12 669.22)	(7 957.70)	(1 143.70)			
Small		7 231.4	4 516.4	589.4	12 337.3	0.62	0.08
	<i>Std</i>	(5 890.83)	(4 406.87)	(1 134.69)			
Medium		9 511.1	6 306.8	1 058.4	16 876.3	0.66	0.11
	<i>Std</i>	(11 006.73)	(7 309.79)	(3 299.46)			
Large		10 462.1	5 913.3	1 085.8	17 461.3	0.57	0.10
	<i>Std</i>	(13 537.06)	(6 970.94)	(3 637.48)			
Very Large		15 370.6	8 503.2	2 317.5	26 191.3	0.55	0.15
	<i>Std</i>	(19 241.87)	(14 785.06)	(5 053.90)			
Gender							
Male		9 337.1	5 742.0	985.0	16 064.1	0.61	0.11
	<i>Std</i>	(11 143.74)	(8 529.98)	(2 987.52)			
Female		8 674.6	4 761.9	803.3	14 239.8	0.55	0.09
	<i>Std</i>	(18 323.59)	(8 277.01)	(3 289.62)			
Origin of Ownership							
Firms with Foreign Equity		11 716.9	7 108.2	1 569.3	20 394.4	0.61	0.13
	<i>Std</i>	(15 109.43)	(10 675.41)	(4 328.28)			
Pure Local ownership		7 266.8	4 491.5	455.5	12 213.8	0.62	0.06
	<i>Std</i>	(10 400.39)	(6 141.05)	(1 097.74)			

Source: World Bank, *RPED Nigeria, 2001*.

Table A.15:
Monthly Wage of Production Workers in Naira by Ownership, Size, and Sector

1 - By ownership	Firms with Foreign	Pure Local			
	Equity	ownership			
Chemicals/paints	10 036.0	6 475.9			
<i>Std</i>	<i>(2 790.36)</i>	<i>(3 138.84)</i>			
Food/Beverage	28 692.0	6 227.3			
<i>Std</i>	<i>(16 784.38)</i>	<i>(2 961.37)</i>			
Metal	12 186.5	8 324.0			
<i>Std</i>	<i>(6 749.95)</i>	<i>(7 483.42)</i>			
Non-Metal	8 666.7	12 260.4			
<i>Std</i>	<i>na</i>	<i>(9 955.47)</i>			
Paper/Printing/Publishing	9 412.3	7 267.0			
<i>Std</i>	<i>(2 594.82)</i>	<i>(4 283.65)</i>			
Pharmaceuticals	9 004.2	6 915.2			
<i>Std</i>	<i>(3 181.06)</i>	<i>(3 439.81)</i>			
Plastics	9 077.4	5 673.0			
<i>Std</i>	<i>(3 125.86)</i>	<i>(2 435.88)</i>			
Textile	9 740.9	7 714.2			
<i>Std</i>	<i>(2 405.49)</i>	<i>(3 935.74)</i>			
Wood	7 773.3	4 820.8			
<i>Std</i>	<i>(2 567.52)</i>	<i>(2 156.14)</i>			
2 - By size	Very Small	Small	Medium	Large	Very Large
Chemicals/paints	5 110.5	9 765.4	7 248.9	10 352.0	12 131.7
<i>Std</i>	<i>(1 406.68)</i>	<i>(1 266.93)</i>	<i>(3 481.98)</i>	<i>(2 949.27)</i>	<i>(0.00)</i>
Food/Beverage	5 609.1	4 742.2	10 355.3	8 152.0	31 492.7
<i>Std</i>	<i>(2 478.30)</i>	<i>(2 798.03)</i>	<i>(4 240.82)</i>	<i>(2 597.40)</i>	<i>(16 328.49)</i>
Metal	7 978.4	12 199.8	10 120.1	8 262.3	20 747.5
<i>Std</i>	<i>(2 615.82)</i>	<i>(9 135.27)</i>	<i>(7 401.87)</i>	<i>(3 522.44)</i>	<i>(8 900.27)</i>
Non-Metal	5 220.8	19 300.0	8 666.7	na	na
<i>Std</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>
Paper/Printing/Publishing	7 264.3	9 446.9	8 993.8	8 066.8	na
<i>Std</i>	<i>(4 584.58)</i>	<i>(3 803.42)</i>	<i>(2 977.23)</i>	<i>(1 176.75)</i>	<i>na</i>
Pharmaceuticals	3 489.0	8 254.2	9 984.8	4 114.6	na
<i>Std</i>	<i>(1 063.18)</i>	<i>(3 458.97)</i>	<i>(1 739.83)</i>	<i>(1 605.23)</i>	<i>na</i>
Plastics	6 969.4	5 947.9	9 669.4	6 575.0	7 328.9
<i>Std</i>	<i>(2 544.11)</i>	<i>(3 184.57)</i>	<i>(4 796.82)</i>	<i>na</i>	<i>(5 238.01)</i>
Textile	na	7 352.1	10 255.8	8 912.8	9 793.3
<i>Std</i>	<i>na</i>	<i>(4 095.63)</i>	<i>(3 442.88)</i>	<i>(1 568.76)</i>	<i>(1 824.46)</i>
Wood	4 964.4	na	na	6 104.0	na
<i>Std</i>	<i>(2 240.95)</i>	<i>na</i>	<i>na</i>	<i>(2 919.09)</i>	<i>na</i>
3 - By Location	East Region	Lagos and South	North Region		
	Region				
Chemicals/paints	4 782.1	8 253.2	6 916.7		
<i>Std</i>	<i>(1 321.59)</i>	<i>(3 543.58)</i>	<i>(363.24)</i>		
Food/Beverage	14 093.6	15 136.4	11 857.1		
<i>Std</i>	<i>(12 915.57)</i>	<i>(17 323.09)</i>	<i>(5 316.59)</i>		
Metal	12 521.5	9 780.8	10 867.6		
<i>Std</i>	<i>(12 861.47)</i>	<i>(3 643.07)</i>	<i>(8 086.09)</i>		
Non-Metal	na	6 943.8	19 300.0		
<i>Std</i>	<i>na</i>	<i>(2 436.57)</i>	<i>na</i>		
Paper/Printing/Publishing	8 440.9	8 106.7	8 554.2		
<i>Std</i>	<i>(4 338.50)</i>	<i>(3 721.71)</i>	<i>(3 109.40)</i>		
Pharmaceuticals	2 783.3	8 145.6	7 595.2		
<i>Std</i>	<i>(164.99)</i>	<i>(3 681.56)</i>	<i>(2 704.60)</i>		
Plastics	6 127.8	8 093.7	6 377.8		
<i>Std</i>	<i>(2 566.05)</i>	<i>(3 704.80)</i>	<i>(2 606.73)</i>		
Textile	8 639.6	9 230.7	9 442.1		
<i>Std</i>	<i>(5 676.22)</i>	<i>(1 667.45)</i>	<i>(2 627.57)</i>		
Wood	4 910.0	6 168.1	4 097.6		
<i>Std</i>	<i>(2 762.26)</i>	<i>(2 172.83)</i>	<i>(2 166.12)</i>		

Source: RPED Nigeria

Table A.16: Definition of Variables

Dependant variable:

Log of net wage, i.e. wage plus bonus and allowance for all workers of the sample for which there is a complete set of data.

Workers characteristics:

Education: *School leaving age minus seven.*

Experience with Firm: *Number of years spend working in the same firm.*

Experience²: *Square of "Experience with Firm" variable.*

Other prof. experience: *Number of years worked elsewhere.*

Non African: *dummy variable equal to 1 if the interviewed employee is a non African worker, 0 otherwise.*

Gender: *dummy variable equal to 1 if the interviewed employee is a male worker, 0 otherwise.*

Weekly hours worked: *no. of hours worked per week.*

Trained: *dummy variable equal to 1 if the interviewed employee had received any vocational training in the past, 0 otherwise.*

Sector dummies: *Equal to 1 if the firm belong to a specific sector, 0 otherwise.*

Firm characteristics.

Age of the firm: *Number of years of existence of the firm computed as 2001 minus the year of creation.*

Foreign Ownership: *dummy variable equal to 1 if the firm of the interviewed employee has any foreign equity, 0 otherwise.*

Lagos/South: *dummy variable equal to 1 if the firm of the interviewed employee is located in the Lagos/south region as defined in the sampling, 0 otherwise.*

Rent-Sharing.

Log Profit per Worker: *log of profit per worker inside each firm.*

Union in Firm: *dummy variable equal to 1 if more than 10 % of the firm employees belong to a union, 0 otherwise.*

Permanent Worker: *dummy variable equal to 1 if the interviewed employee is a permanent worker, 0 otherwise.*

Log. Employ. Change: *average number of firing in 2000 in sample firms from the same sector or production.*

Efficiency wage:

Supervision: *ratio of the sum of Managers, Proprietors (working as Managers), Supervisors and Foremen to the total workforce.*

Complexity: *ratio of foreign economists/programmers/technicians to the total workforce in each firm.*

Turnover: *ratio of the sum of the workers who were hired, fired and who left the firm in 2000 to the total number of employees.*

Hold-Up Theory:

Specific investment: *log of the value of the last investment in equipment.*

5. Access to Finance

According to our survey data, lack of finance is a key problem in the Nigerian manufacturing sector. While almost all firms have relations with banks and are able to access at least some external finance, it is very costly and, for most firms, insufficient. Inadequate access to finance appears among firms' three biggest business problems more often than any other problem except uncertainty and poor infrastructure. Lack of credit forces enterprises to rely on internally generated funds both for working capital and for investment. This hampers firms' ability to manage their working capital, making it difficult for them to increase sales and operate at full capacity. The shortage of finance also limits investments to improve technology, lower costs, and expand output. The high cost and limited availability of credit are a major factor that raises the cost of doing business and lowers competitiveness in Nigeria.

Firm-Level Access

Access to credit is a problem in most developing countries, and Nigeria fits the pattern. The majority of Nigerian manufacturing firms do get some external finance, as reported in Table 5.1. Over 80 percent of the firms we interviewed reported that they have access to some type of credit including bank overdrafts, loans, import/export facilities, or loans from directors and parent companies. However, while most firms do have some access to credit, there is not enough affordable credit to adequately support trade and manufacturing.

The bulk of available credit comes from domestic banks; more than 77 percent of our sample reported that they had access to bank credit. A few enterprises had loans from the International Finance Corporation, the Nigerian Investment Development Corporation, or other development agencies, but these sources were inconsequential. No firms reported using leasing or finance companies. Almost all loans are in Naira. Only 7 loans reported in our survey were in foreign currencies, and these were from parent companies or development agencies, not banks. Only two firms in the sample had loans from foreign banks, and these were also arranged by the parent company.

Banking facilities are spread throughout the country and are widely available. The average firm in our sample deals with four banks and the largest firms deal with eight on average. The high number of banks is a holdover from the days when foreign exchange was controlled and a bank could only lend a fixed amount to each customer. Consequently, firms dealt with numerous banks to obtain their required foreign exchange.

Table 5.1: Percentage of Firms Having Access to External Credit

Group	Percentage Constrained
Full Sample	80.3
Micro	51.7
Small	81.8
Medium	89.8
Large	100.0
Very Large	93.1
Foreign Owned	93.6
Indigenous	70.2

Despite the widespread availability of credit facilities, firms feel that inadequate finance is a major impediment. According to the data in Table 5.2, almost 40 percent of the sample said that they were credit constrained—they cannot borrow as much as they would like at current interest rates. Only 23 percent of the sample reported having bank loans (this does not include overdrafts), and 20 percent of the sample said that they had been rejected for a loan sometime in the past. More than half the firms stated that they had never applied for a loan. Almost half of these firms said they would like a loan, but that interest rates and collateral requirements were too high or that they did not think they would be approved for a loan.

Table 5.2: Percentage of Firms Reporting Being Credit Constrained

Group	Percentage Constrained
Full Sample	38.5
Micro	48.2
Small	38.6
Medium	36.7
Large	36.1
Very Large	25.0
Foreign Owned	33.3
Indigenous	42.5

The larger a firm is, the more likely it is to have access to external sources of credit. Almost 100 percent of firms with more than 250 employees have access to credit compared to only 52 percent of micro firms and 80 percent of small firms. Over 90 percent of foreign firms have access, while just over 70 percent of the indigenous firms do. This does not necessarily mean that small firms are cut out of the market because they lack collateral or are considered more risky. It may be that large firms require larger amounts of capital. However, almost 50 percent of the micro firms and over 35 percent of small firms report being credit constrained as opposed to 25 percent of the very large firms. Foreign firms were also less likely to report being constrained than indigenous firms. This suggests that small firms and indigenous firms may be rationed out of the credit market.

Banks

Banks in Nigeria are highly liquid and report that they would like to make more industrial loans. But they believe that lending to the manufacturing sector is very risky, and increasing credit to the manufacturing sector is not justified in terms of risk and cost. The high risk comes from a number of sources. It is difficult to obtain information on a firm's true financial condition and performance. The judicial system is reportedly inefficient; banks cannot easily enforce contracts. The business environment in general is very risky and uncertain, so firms may not be able to service debt. Consequently, banks charge high interest rates, demand high levels of collateral, and make few loans of more than a year in term.

Most bank debt is provided in the form of overdrafts, and almost 70 percent of the sample had access to such facilities (see Table 5.3). Banks rarely provide loans longer in term than one year, so firms prefer to take loans in the form of overdrafts where they are only charged interest on the amount that they borrow. Since overdrafts are commonly rolled over, unless the borrower's financial situation changes, firms often rely on overdrafts to finance long-term investments. Just like loans, overdrafts have to be fully collateralized and their average interest rates are 23.5 percent, similar to short-term bank loans. It is interesting to note that larger firms reported lower interest rates on overdrafts. The difference in the average interest rate on overdrafts between the very largest and the micro firms is over 5 percent. This suggests that the interest rate differential reflects a risk premium and not just higher costs of administering smaller loans. Foreign-owned firms also report lower interest rates. Companies report that overdraft limits are determined by companies' ability to provide collateral and not by their business plan or future potential.

Table 5.3: Interest Rate on Overdrafts

Group	Percentage Constrained
Full Sample	23.5
Micro	25.1
Small	25.2
Medium	23.2
Large	23.2
Very Large	20.8
Foreign Owned	21.8
Indigenous	25.4

The interest rates on short-term loans are similar to those on overdrafts. Because short-term loans are usually rolled over every year, there is effectively little difference between them and overdrafts and often firms confuse the two. The average level of collateral for those firms in the sample who reported was 151 percent of the value of the loan. This can tie up substantial capital and raises the cost of loans. In addition, there are various fees associated with requesting and processing loans. Most firms we spoke with said that the full cost of short-term credit approaches 28-30 percent for the best borrowers. Some borrowers report having to spend much more in fees and "under the table" payments. However, most managers say that this is only true when the borrower does not intend to use the money as it should or is not truly creditworthy. In this case, borrowers must pay off the bank officials to not scrutinize the use of funds.

Long-term finance is very rare, and only the most creditworthy receive it. According to Table 5.4, less than 16 percent of the sample reported having loans with a term of more than one

year. Medium and large firms were more likely to have long-term loans. Very large firms tend to have enough internal sources of funds, and the smaller firms are often viewed as less credit worthy. Foreign-owned firms were almost twice as likely to have long-term loans than indigenous firms, reflecting that fact that they are usually part of a group or subsidiaries of larger firms who are able to supply them guarantees. The lack of long-term credit forces companies to finance investment with internal funds or overdrafts. Firms are often forced to delay investment until they have built up the necessary capital. Some managers said that since they had to rely on short-term funds, they were hesitant to undertake major investments because they could not be certain to have the funds to complete them.

Table 5.4: Firms Receiving Long Term Loans

Group	Percentage Constrained
Full Sample	15.6
Micro	12.1
Small	11.4
Medium	20.4
Large	20.5
Very Large	10.3
Foreign Owned	21.3
Indigenous	11.3

Trade Credit

After commercial banks, the other major source of external finance is trade credit. This refers to the short-term credit extended to companies by their suppliers and by companies to their customers. Trade credit is common in Nigeria but not as common as it could be. Between 75 and 80 percent of our sample reported giving or receiving trade credit. The median time to pay for both buyers and sellers is 30 days. Less than 30 percent of firms surveyed give a cash discount to customers who pay cash, but the median discount is 5 percent. The typical arrangement in some developed countries is to give customers 30 days to pay with a 2 percent discount for cash, and on the surface it appears that Nigeria is operating close to this.

This belies the fact that only a few customers are actually given trade credit. The legal and judicial system is such that few firms are willing to rely on courts to enforce contracts. If a customer fails to pay, a firm's only recourse is to deal with the customer on a cash basis and hope to one day be paid. Almost no firms in the survey went to court to try and resolve contractual problems. Consequently, firms only extended trade credit to their most valued and trusted customers.

Despite the hazards of giving credit, the ratio of accounts receivable to sales and accounts payable to sales in Nigeria compares favorably to those in the United States. Tables 5.5-5.7 give median trade credit ratios for a sample in the United States, Nigeria, and Nepal (which was recently surveyed by RPED). The median ratio of accounts payable is higher in our sample than in the United States or Nepal. The ratio of accounts receivable to sales falls between the large and small firms in the United States and is higher than in Nepal. It appears that the Nigerian firms give and receive proportionally as much trade credit as firms in the United States do and more than Nepal. But most firms in Nigeria only give credit to a few trusted companies and often times accounts receivables build up because customers cannot pay. In this case, the creditor is

forced to give more time to his/her customers. So while the trade credit ratios are high, it is not necessarily a healthy system.

Table 5.5: Ratio of Accounts Payable to Sales

Group	Nigeria	Nepal
Full Sample	.097	.039
Micro	.038	.030
Small	.090	.078
Medium	.097	.051
Large	.110	.044
Very Large	.118	.016

Table 5.6: Ratio of Accounts Receivable

Group	Nigeria	Nepal
Full Sample	.128	.100
Micro	.127	.120
Small	.085	.157
Medium	.145	.105
Large	.170	.051
Very Large	.116	.089

Table 5.7: Trade Credit for Manufacturing Firms in the US

	Median Accounts Payable	Median Accounts Receivable
Small Firms	.042	.100
Large Firms	.074	.170

Looking at net trade credit to sales (defined as accounts payable minus accounts receivable divided by sales), we see that the most Nigerian firms are net creditors, but just barely. The sample median is only -0.00263. The mean net trade credit ratio is positive, with a value of 0.0968. However the variation among firms in very large, with a few firms having net trade credit more than 5 times greater than sales, pulling the mean net trade credit ratio to 0.0968. There appears to be no pattern based upon size, sector, or ownership status. The large variation among firms in net trade credit suggests that the level of credit is based upon the relationship that individual firms have with their customers and suppliers and the nature of the business in which they are engaged. In some developing countries, manufacturing firms must use trade credit as a marketing tool. They provide trade credit to distributors while receiving little from suppliers. Thus, they are net creditors and face severe pressure on their cash flow. This does not appear to be the case in Nigeria, where almost half the manufacturing firms are net debtors, and their status as net providers or suppliers of credit does not seem to be related to size or line of business. However, this observation is based on a cursory look at the data and requires further research.

Investment

Evidence from the RPED survey suggests that investment by Nigeria’s manufacturing sector is low by world standards, but high compared to many other Sub-Saharan African countries. While only a few firms in the sample made large investments, the majority of firms made at least some equipment investment in the last three years. However, nearly half the firms in the sample did not even invest enough in 1999 to cover their reported depreciation. It is almost certain that the low investment rate is a major factor affecting the growth rate in Nigeria.

Table 5.8: Investment to Capital Ratios

	I/K 98	I/K 99	I/K 00	All 3 Years
Mean	.083	.111	.095	.263
Median	.005	.025	.010	.098

	Mean I/K	Mean I/K
Nigeria 2000	.09	.03
Cameroon	.11	0
Ghana 1993	.13	.003
Kenya 1994	.11	0
Zimbabwe 1994	.12	.03
South Africa		
India		
US		

The average investment level in Nigeria is higher than many other African countries. Table 5.8 provides the mean and median of the average ratio of equipment investment to the market value of capital stock for firms in the sample between 1998 and 2000. The median is 0.03 (the best measure of central tendency because of the high standard deviation), higher than similar figures in Cameroon, Ghana, and Kenya but lower than Zimbabwe and South Africa. It is also considerably lower than the United States or India.

Investment in most developing countries is lumpy, and Nigeria is no exception. In many years firms did not invest at all; in others they made major investments. Investment is indivisible, and it takes firms time to build up enough capital to make the investment and to assimilate the new technology. Almost 80 percent of the firms in the sample did invest in equipment in the past three years. However, in 2000, only around 56 percent of the sample made an equipment investment. Part of the reason that investment is not smooth may be due to imperfect credit markets, which force firms to build up internal funds before making investments. Part of it may also be due to the uncertain business environment. But it is clear that a larger proportion of firms in Nigeria invest than do firms in other Sub-Saharan African countries. A higher proportion of Nigerian firms invested in 2000 than did firms in the last year of data available for Cameroon, Ghana, or Kenya.

As usual in African countries, size appears to be an important determinant of investment. The median of level of investment to capital ratio for the three-year period increases directly with size, as shown in Table 5.9. The largest firms have a median ratio more than 10 times higher than the microfirms.

Table 5.9: Median Investment to Capital Ratios

Size Category	Median I/K
Micro	.008
Small	.024
Medium	.027
Large	.042
Very Large	.09

The investment to capital ratio of the sample firms shows that the level of investment is low by world standards. The table gives two measures for the three years that the survey collected data; the ratio of total investment to capital as well as equipment investment to capital. The last column gives the mean and median of the three-year mean of the 149 firms for which we have observations in all three years. The vast majority of investment was in equipment. The median equipment investment ratio (equipment to capital) for the full three-year period is only 0.053. The ratios in all years are highly skewed with the means being much higher than the medians. This is no different from what is found in other developing countries, and results from many firms not investing at all or investing very little while a few firms make substantial investments. The median, the best central measure, shows that the investment rate has increased between 1997 through 1999.

The data for investment by size categories show that the investment rate for firms with more than 500 workers was almost three times that of the next highest group.¹⁸ Firms have very high investment in 1997 suggesting that many of these firms made their initial start up investment or introduced new technologies in 1997. At the other extreme, investment by firms with less than 50 workers was very low and more than half the firms made no investment in any year. For the size categories of 50 to 500 workers, the rates of investment are similar; they are much greater than the firms with less than 50 workers and much less than the super-sized firms. The rates of investment mirror access to credit. The very large firms in our sample have much better access to formal credit, use bank credit to finance much of their investment, and have much higher rates of investment. The smallest firms have less access to formal credit and use commercial banks for only a small portion of their investment.

¹⁸ The following tables present only the equipment investment rate. The pattern for total investment was the same as would be expected since the vast majority of investment is in equipment.

6. The Protection of the Manufacturing Sector in Nigeria

The economy of Nigeria remains in a precarious situation as of 2001. While Nigeria is the sixth largest world exporter of oil, it still ranks among the low-income countries of western Africa. This is mainly a consequence of a troubled political and economic history. The emergence of an oil industry in the 1960s and the oil boom of the 1970s led to a severely overvalued exchange rate that undermined traditional industry and domestic agricultural production. By the end of the 1970s, over-ambitious development plans were devised that led to various wastage, favored the development of corruption, and ultimately contributed to the country's debt problem, as these plans were maintained with foreign borrowing when oil prices fell in the early 1980s. Faced with increasing economic problems, Nigeria launched an IMF-style program of adjustment in 1986. This policy shift allowed Nigeria to obtain debt rescheduling from its creditors and fostered growth. However, these positive developments did not survive the 1990s, which were characterized by numerous policy shifts and unfulfilled expectations (IMF 2001). These events were not neutral for the evolution of the Nigerian manufacturing sector, which is of minor importance compared to the dominating oil sector. By the end of the 1990s, manufacturing industry accounted for about 5.5 percent of GDP, while the average was 15 percent in low and middle income countries in Sub-Saharan Africa (World Bank 2001a). In the mid-1990s, manufacturing provided less than 3 percent of export earnings and employed about 300 000 persons, or less than one percent of the available labor force (World Bank 2001a).

Two various types of explanations are usually put forth to account for this dismal performance. A first set of analyses focuses on macroeconomic and political events. The discovery of oil resources in the 1970s may have implied a form of "Dutch Disease" (Bevan, Collier, and Gunning 1992, 1996), thereby reducing the relative profitability of the sector. Moreover, the existence of an official and parallel exchange rate market further distorted the incentive structure (Azam, 1999), allowing cheap capital imports and favoring inefficient oversized industrial projects. Another explanation relies on the latent political instability faced by the country since the 1960s. This provided a strong disincentive to foreign investment in many sectors and created an unstable environment for firms. A second type of explanation is more microeconomic in essence, relying on uncertainty and incentive types of arguments. Okechuku and Onyemah (1999) argue that Nigerian consumers exhibit risk-averse behavior. Faced with numerous unknown local brands, they tend to choose imported foreign products over domestically produced ones to reduce uncertainty about the quality of the goods. Such a marked preference for foreign products reduces the demand for domestic manufactures and may explain the decline of segments of the manufacturing sector.¹⁹ The structure of incentives embodied in the tariff policy of the country is often quoted as another possible explanatory factor of the minor importance of the sector. Until roughly the middle of the 1980s, a strategy of import substitution was implemented. It implied high protection levels. Between 1988 and 1995, various tariff reforms aimed at abolishing the impediments to trade were introduced but did not succeed in fully restoring a proper structure of incentive.

This chapter focuses on the last type of explanation. It analyses the level of protection granted to the manufacturing sector at the turn of the millennium. The first section provides a brief overview of past trade policy in Nigeria and the various attempts of reform. A second section

¹⁹ "It has been blamed for the reduction in the domestic assembly of Peugeot 504 automobile from 100,000 units in 1986 to about 4,500 in 1996, and the closure of the Volkswagen assembly plant in 1994" (Okechuku and Onyemah 1999).

analyzes the structure of nominal protection, both at the two-digit level of the tariff classification and firm level. It is based on the existing tariff scheme and a subsample of 95 manufacturing firms from the 2001 RPED survey.²⁰ The third part provides estimates of effective rates of protection. It relies on a restricted sample of 59 firms for which the required output/input data are available.²¹ A final section concludes and suggests a few improvements.

An Overview of Trade Policy Reforms in Nigeria

Nigeria was one of the last countries in Sub-Saharan Africa to adopt a program of reform. The process started in 1986 with the adoption of a structural adjustment program (SAP), which led to the implementation of diverse liberalization measures (abolition of various agricultural commodity boards, a modest reduction in fuel subsidies, some banking deregulation), tight fiscal and monetary policies (initially at least), a sizeable devaluation, and a partial liberalization of the trade policy. It appears that the process of reforms that started about 15 years ago has been only partially successful; imbalances on the foreign exchange market remain and the tariff policy still creates distortions.

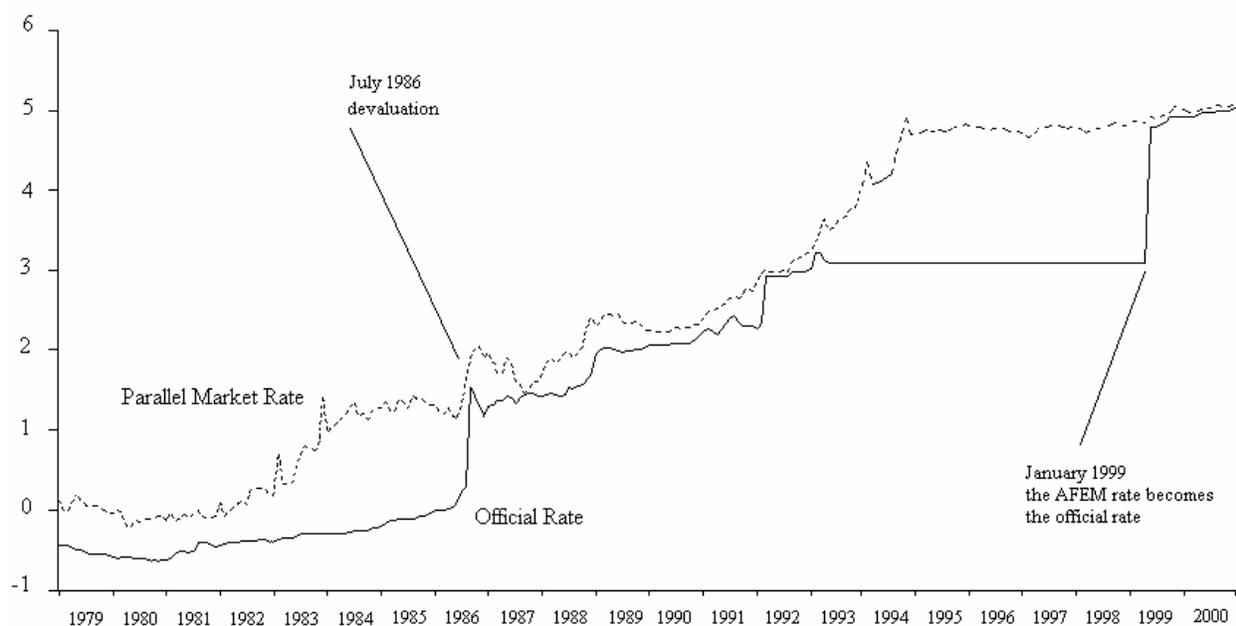
One of the most pressing issues at the time of the first SAP was the overvaluation of the exchange rate and the existence of a significant parallel market (Figure 6.1). Over the January 1979 to July 1986 period, the black market premium averaged 86.2 percent, reaching a 172 percent peak in late 1983 (Azam 1999). The 1986 SAP replaced the previous system of administrative allocation of foreign exchange by an auction mechanism, with a view of liberalizing the current account transactions and creating an automatic, transparent system. However, the government still closely controlled the auction's functioning. At the time, it used to sell dollars in the official market at a sizeable discount, compared to the parallel market exchange rate, to a small number of selected intermediaries (Odubogun 1995). This premium on foreign currencies transacted in the parallel market can be interpreted as a means for taxing private exporters, with a view to subsidize implicitly government imports (Pinto 1989). The 1986 devaluation succeeded in reducing significantly the imbalance on the exchange rate market. It translated almost immediately into an impressive 68 percent real depreciation of the currency between 1986 and 1987 (Figure 6.2). From July 1986 until December 1993, the average parallel market premium was down to 35.4 percent. In spite of a large initial impact, the 1986 reform never managed to totally eliminate the parallel market premium, which widened again significantly starting in 1993. The fundamental reason for the persistence of a gap between the official and parallel rates was in the inability of the authorities of the time to restore a credible macroeconomic equilibrium.

In late 1992, in an attempt to eliminate the parallel market premium while holding the official exchange rate stable, the government almost completely exhausted foreign exchange reserves in the span of a few months. Subsequently, the weekly auctions were suspended in early 1993. After reopening the auction, the Naira was revalued and foreign exchange was rationed through the financial sector. After various adjustments, the official rate was settled at 21.886 Naira per dollar in mid-1993 and remained unchanged until January 1999.

²⁰ Firms with missing or incomplete data were removed when computing the levels of nominal protection. The related distribution of firms is shown in annex for this chapter.

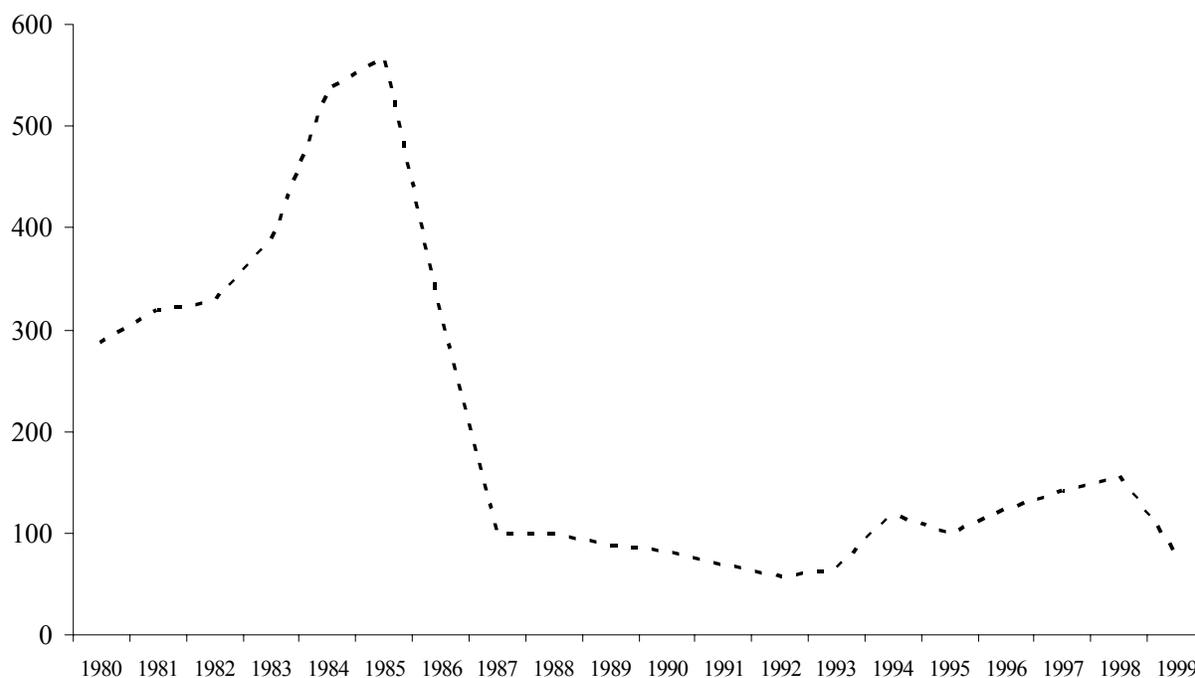
²¹. See Table B.1.

Figure 6.1:
Monthly Parallel and Official Exchange Rates in Logarithmic Scale (1979-2000)



Source: Azam (1999) and IMF country reports various years.

Figure 6.2: Yearly Real Effective Exchange Rate (1990=100)



Source: World Bank 2001.

In 1995, a new attempt at liberalizing the exchange rate market took place. An autonomous foreign exchange market (AFEM) was created for all non-government and non-petroleum transactions.²² On this market, exchange rates would be determined freely by authorized buyers and sellers of foreign exchange. This market was however only partially free as the government retained the right to be an "active participant." Hence, by 1997, the Central Bank intervened every week on this market on the basis of a rate determined after prevailing interbank rates and the rate of the parallel market. In consequence, the AFEM rate closely followed the parallel market rate making the official rate unsustainable. In January 1999, the official rate disappeared, the AFEM rate became the "official rate." This immediately reduced the black market premium to 10.2 percent in January 1999 compared to 310.2 percent in December 1998. The steady real appreciation of the currency that had started in late 1993 was brought to an halt, and the real effective exchange depreciated by 49 percent between 1998 and 1999.

In the end, it appears that Nigeria has been unsuccessful in unifying its exchange rate market and the black market premium was again on the rise in late 2000/early 2001, triggering a renewed real appreciation of the currency.²³ Over time, the various periods of real appreciation of the currency are likely to have hampered the development of the tradable sector, including manufacturing.

This brief account of the evolution of the exchange rate mechanism over the last two decades underlines how fast the environment of firms changes and how much uncertainty is created, as sometimes the measures implemented have a retroactive character. The evolution of the commercial policy of Nigeria provides another example of this fast-evolving regulatory environment. The policy of import substitution pursued in Nigeria until the first SAP was characterized by high levels of protection, a cascading tariff structure, and various bans on the import of selected goods. Trade policy with respect to manufacturing in Nigeria reflected two implicit assumptions: (i) that industrial development could be based on the processing of domestically produced raw materials; and (ii) that the government was able to select "priority" sectors for assistance (Fine 2001).

Hence, until the end of the 1980s, the Nigerian economy was highly protected with an average unweighted nominal rate on imports well above 30 percent (World Bank 2001a) and individual tariffs were adjusted frequently, often on an ad-hoc basis. In 1988, as a part of the SAP of the time, a new seven-year tariff schedule was introduced. It abolished several impediments to trade (commodity boards, imports licensing, price controls, etc.). The broad aim was, through the liberalization, to bring incentives more in line with world prices and to simplify the protection system. Another objective of the reform was to lower the uncertainty faced by firms by relying on a pre-set tariff schedule aimed at avoiding the past behavior of frequent and arbitrary tariff changes. If adjustments in the existing tariff were needed, this would be taken care of by an independent Tariff Review Board aimed at shielding the decision makers from the pressures exerted by the various lobbies. According to analysts, the results of the reform were poor: protection remained high (nominal tariffs still ranged between 0 and 300 percent), the tariff dispersion was wide, amendments were numerous, the administrative procedures were questionable, and "ad-hoc/on request" adjustments were still often requested and implemented

²² For a detailed account of the exchange rate policy in Nigeria starting from the mid-1990s, see IMF (1998, 71–81).

²³ Nigeria has at present three different exchange rate markets, the parallel one, the AFEM and a recent open-interbank market (the NIFEX, or Nigerian Interbank Foreign Exchange, which was created in late 1999) where banks trade among themselves at freely negotiated rates.

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(ECG 1995; Fine 2001). Over the 1989–1994 period, 14 percent of all two-digit product categories still faced an import prohibition even though import quotas had been removed (Michalopoulos 1999). A year before the completion of the schedule, in 1993, duties averaged 27 percent for capital goods, 41 percent for intermediate goods, and 46 percent for consumer goods (ECG quoted in Fine 2001).

A new pre-set schedule, valid until 2001, was introduced in 1995. This pursued the same global aim and attempted to further decrease existing tariffs and reduce uncertainty for firms. The import liberalization then undertaken also aimed to reduce significantly the reliance on quantitative restrictions. Only *ad valorem* tariffs were used in the new pre-set schedule. Import duties consisted of a basic rate of customs duty modified by an annually set rebate, plus a 7 percent surcharge (WTO 1998). The 1995-2001 tariff structure was designed to stimulate competition and efficiency by reducing tariffs on consumer items relative to tariffs on raw materials and intermediate and capital goods. The reduction of tariffs on final consumer goods aimed to expose domestic manufacturers to import competition, while the relatively higher tariffs on raw materials were supposed to attract investment into raw material and intermediate goods production (WTO 1998). In the course of the reform program, all excise duties levied on domestically produced goods were removed in January 1998. Finally, as of 2000, most bans on imports were abolished (Fine 2001).

Nominal Protection in 2000

An analysis of the current level of nominal protection in manufacturing raises three broad sets of issues. First, it is necessary to assess whether or not the 1995-2001 reform was implemented as expected and if it reduced tariff uncertainty for firms. Second, the current overall level of nominal protection can be estimated and compared with other countries. However, the previous analysis is based on the tariffs and does not take into account that firms have multiple outputs and inputs, often subject to different tariffs. As a third and final step, it is thus necessary to compute firm-level indexes of protection. Each of these problem is addressed in turn.

Data suggest that the implementation of the 1995-2001 reform was imperfect and that the level of nominal protection in Nigeria remains high. In spite of a decrease compared to its 1994 level, protection in Nigeria is still higher than the average levels for developing and industrialized economies.

The application of the 1995-2001 tariff reform. The impact of the 1995-2001 round of tariff changes can be assessed by computing nominal protection coefficients (NPC). These allow for an analysis of the pattern and level of protection. The tariff data used for the exercise come from the latest available official publication (FGN 2001) at the time of writing and have been adjusted by taking into account the changes made public every fiscal year between 1995 and 2000.²⁴ The

²⁴ Every year, one or more "Custom, Excise and Tariff Decrees/Amendments" are devised. They embody the changes/adjustments in tariffs for the year and reflect the choices stated in the budget (or other considerations). Decrees taken into consideration were:

- Decree n° 13 of 04/19/1996
- Decree n° 16 of 08/12/1997
- Decree n° 20 of 09/30/1998
- Decree n° 29 of 05/10/1999

NPC is usually defined as the ratio of the appropriately adjusted domestic price and a comparable world price. When a protection regime is entirely based on tariffs and there are no quantitative restrictions to trade, NPCs equal one plus the tariff rate. Due to both data limitations and the official removal of most quantitative restrictions (QRs) in Nigeria, this definition is retained for the rest of the section.²⁵

Two types of NPCs are used. First, ex-ante NPC, based on the officially pre-set schedule of tariffs are computed. Secondly, ex-post NPCs, taking into account the various yearly changes which occurred are estimated. Detailed figures are reported in Table B.2. If ex-ante and ex-post NPCs are similar, it can be stated that the reform was implemented as expected; otherwise, it was not.

The analysis of ex-ante and ex-post NPCs suggests that while for many products yearly changes in tariffs have a minimal impact, there are a few significant exceptions. At the two-digit level of the tariff classification, products from categories "22–Beverage, Spirits,...", "57–Carpets and Other Textile Floor Coverings", "58–Special Woven Fabrics" and "10–Cereals" had their average ex-post NPCs increase from 3 to 7 percent. The range of existing tariff rates also remains wide, the minimum ex-post NPC being equal to one (zero tariff) while the largest ones reach two (or a 100 percent tariff). The yearly changes also impacted on the dispersion of tariffs inside each two-digit product category. For many goods, the ex-post dispersion (measured by the standard deviation of the ex-post NPC) increased. In some cases, the impact was extreme. Products from categories "57–Carpets and Other Textile Floor Coverings", "15–Animal or Vegetable Fat and Oils" and "22–Beverage, Spirits,..." have an ex-post dispersion ranging from almost 9 to 29 percent, well above the ex-ante values (Table B.2).

Table 6.1 reports some statistics on the products with the largest ex-post dispersion at the two-digit level; "Tobacco Products" (position 24), Cereals (position 10), Beverages and the like (position 22) are the three products with the largest internal distortion. Moreover, many products reported in this table are primary inputs for manufacturing. Tariff fluctuations on inputs are difficult to cope with in the current firm environment in Nigeria. This provides a strong incentive for some firms to try to reduce import taxes by falsifying the denomination of goods to benefit from lower rates while keeping them within the same two-digit classification.

-
- Decree n° 39 of 01/21/2000

²⁵ The "Nominal Protection Coefficient" (NPC) equals $\left[P_{jk}^D / P_{jk}^W \right]$ for a firm k producing a good j , with P_{jk}^D being the domestic price and P_{jk}^W the relevant world price. When quantitative restrictions (QRs) or other non-tariff barriers (NTBs) to trade are in use, the domestic price results from various other factors (supply/demand balance generated by regulatory policy, the degree of competition in domestic industry, the institutional framework, etc.). In this case, a tariff-based NPC does not capture fully the extent of distortions. The NPC is then better proxied by computing the ratio of ex-factory price to the CIF import price (Ettori 1992). In the current situation in Nigeria, a good approximation is to assume that the dominant distortion is induced by tariffs as most QRs/NTBs have been removed. Then, the domestic price equals $P_{jk}^D = (1 + t_j) \cdot P_{jk}^W$ which simplifies the NPC to $(1 + t_j)$.

Table 6.1: Characteristics of the Most Distorted NPCs by Product Category in 2000

Classification		Consolidated NPC Applied by 2000			
		Average	Standard	Max. NPC	Min. NPC
		NPC *	Deviation		
24	Tobacco and Manufactured Tobacco Substitutes	1.561	0.358	1.800	1.150
10	Cereals	1.445	0.335	2.000	1.150
22	Beverage, Spirits and Vinegar	1.744	0.287	2.000	1.225
88	Aircraft, Spacecraft and Parts Thereof	1.190	0.204	1.550	1.050
49	Printed Books, Newspapers,...	1.180	0.198	1.450	1.000
36	Explosives, pyrotechnic products	1.292	0.183	1.600	1.150
05	Products of Animal origin not specified elsewhere...	1.386	0.180	1.600	1.100
33	Essential oils and resinoids	1.374	0.171	1.600	1.150
19	Preparation of Cereals	1.410	0.161	1.640	1.200
04	Dairy Produces	1.289	0.157	1.550	1.090
15	Animal or Vegetable Fat and Oils	1.288	0.148	1.650	1.050
69	Ceramic Products	1.355	0.147	1.500	1.067
06	Lives Trees and Others Plants,...	1.525	0.144	1.650	1.400
58	Special Woven Fabrics	1.365	0.144	1.650	1.250
96	Miscellaneous Manufactured Service	1.285	0.142	1.550	1.050
42	Articles of Leather	1.283	0.140	1.500	1.150
34	Soap, organic surface-active agents	1.286	0.135	1.450	1.150
32	Tannings or dyeing extracts	1.219	0.124	1.450	1.033
55	Man Made Staple Fibres	1.328	0.123	1.500	1.100
51	Wool, Fine or Coarse Animal Hair	1.277	0.120	1.450	1.150
50	Silk	1.257	0.113	1.450	1.150
17	Sugar and Sugar Confectionnery	1.245	0.108	1.400	1.150
52	Cotton	1.439	0.108	1.560	1.300
11	Products of the milling industry	1.418	0.103	1.600	1.200
67	Prepared Feather and Down	1.350	0.100	1.400	1.200

* Non-Weighted

Source: *Computations on the basis of FgoN (2001)*.

Based on what has been presented here, it is difficult to believe that the pre-set tariff schedule of 1995-2001 was implemented in a consistent manner. Even though about 38 percent of the categories at the two-digit level of classification remained unchanged (Table 6.2) as of 2000 compared to what was planned for 2000 in 1995, 23 percent of the tariff categories had increases and almost 39 percent had decreases. Moreover, the average decrease in the latter was smaller than the average increase in the former. While the dispersion in rates was small for those categories with tariff decreases, the situation was the opposite for the products whose nominal protection increased, where the dispersion remained large.

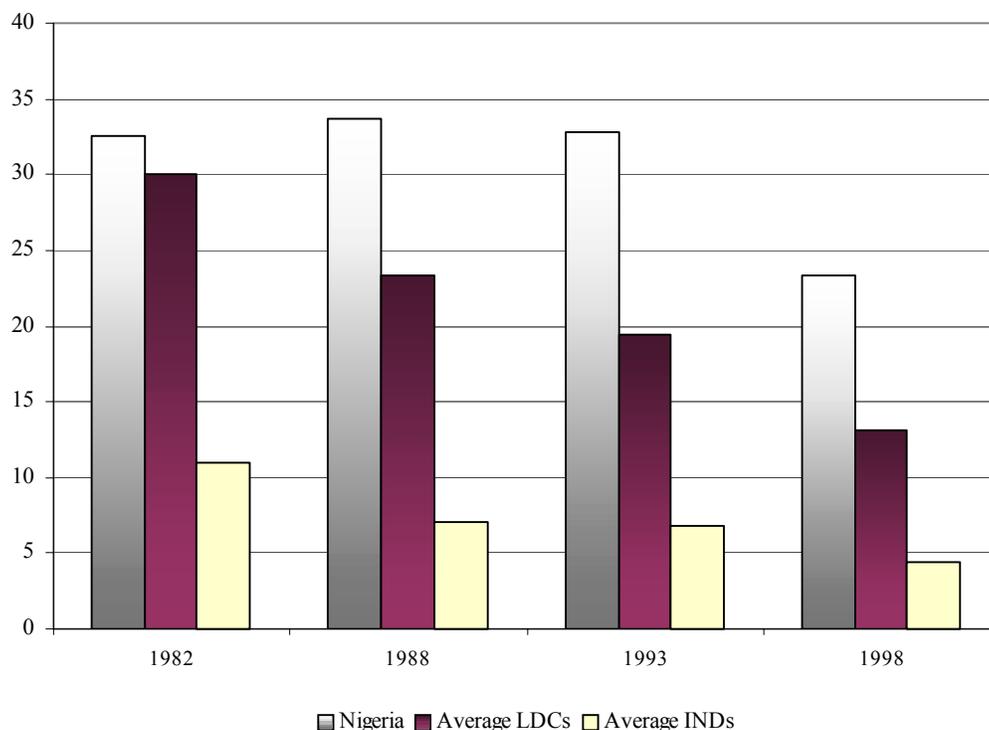
Table 6.2:
Impact on NPCs of the Yearly Changes in Tariffs Compared to the Initial Schedule (C.Pct)

	Average ex-post NPC	Average Change	Dispersion of NPCs
% of Decrease	38.95	-1.08	13.68
% of Increase	23.16	1.69	47.37
% of Stable	37.89	0.00	38.95

Source: Computations on the basis of FgoN (2001).

The overall level of protection in 2000 and a comparison with other countries. The frequent adjustments in rates imply a non-negligible deviation of the tariff structure in 2000 at the two-digit level compared to the initial schedule devised in 1995. However, at a global level, there is virtually no change between the ex-ante and ex-post average NPCs computed on the entire tariff schedule. As of 2000, their respective values were 1.2543 and 1.2524. Hence, deviations from the planned schedule did not really affect the overall level of protection targeted for 2000.

Figure 6.3: Nigeria and Worldwide Trends in Protection
(unweighted tariffs in percentage).



Source: WTO database.

On the positive side, it must be noted that the global level of nominal protection has indeed decreased since the 1995 reforms. WTO data indicate that in 1994, just before the new round of reform, the average unweighted tariff was around 30 percent and had reached about 25 percent in 2000. Yet, was this decrease large enough to bring Nigeria in line with the current protection trends worldwide? It seems the answer is no. Since 1982, Nigerian tariffs have been constantly above the average tariffs applied by industrialized and least developed economies (Figure 6.3).

While data reported in Figure 6.3 do not go beyond 1998, it is unlikely that the trend in a reduction of average tariffs in LDCs and industrialized countries was reversed. Hence, in 2000, the protection in Nigeria was still well above the level of other countries.

The nominal protection at the firm level. The majority of firms in Nigeria are not single product firms but produce a variety of goods and use diverse raw materials that do not necessarily always fit into a single tariff category. This output diversification can be regarded as both a way of broadening companies' sales and risk reducing mechanism, very similar in essence to portfolio choices. Hence, to assess the "true" level of nominal protection granted to a firm, it is necessary to compute a weighted average ex-post NPC at the firm level, with the weight being the share of each product/raw material in the total sales/purchases of a company. The data are reported in Table 6.3 and are related to the five most important outputs and raw materials of the firms, as reported in the RPED survey.

In 2000, at the sector level, firms in the pharmaceuticals industry had the lowest nominal protection (ex-post NPC of 1.156) while companies in the food/beverage sector enjoyed the highest level of nominal protection (ex-post NPC of 1.495). This is not surprising as some food/beverage sector output benefited from ex-post NPCs up to 1.897 while the highest NPC for the pharmaceuticals was about 1.208 percent. Along with the textile sector, firms in the food and beverage industry nonetheless faced the largest dispersion in NPCs, creating strong imbalances in intra-sectoral relative profitability. Based on data reported in Fine (2001), NPCs on output at the firm level in 2000 were higher or in the same range than the corresponding data from 1993. Thus, the decrease in the global level of protection outlined previously did not really go down to the firm level. In terms of raw materials, firms operating in the food/beverage and wood sector seem to face the highest level of protection on inputs. Firms in these sectors also faced the largest dispersion in ex-post NPCs on raw materials. Interestingly, tariffs on raw materials and output are very similar for firms in the "pharmaceutical" industry, for some firms in the sample they even are higher. This is consistent with a complaint reported by several manufacturers in the sector at the time of the survey.

In addition, there seems to be no clear pattern of protection depending on the ownership of firms. Locally owned firms in the food/beverage, chemicals/paints, and plastics industries have a higher nominal protection on output than their foreign counterparts, while foreign firms in the pharmaceuticals, paper/printing/publishing, and textiles have higher NPCs than local companies. The dispersion of ex-post NPCs also varies greatly, but no clear relationship appears with respect to the ownership of firms. The situation is similar for raw materials. Such differences may be explained in part by the bargaining power of some local firms that are able to obtain better protection from the state. For the foreign-owned firms that have a higher nominal protection, this can be seen as compensation granted for the well-known extra costs (unskilled labor cost, insecurity, poor infrastructure, uncertainty in regulations, etc.) incurred when operating in Nigeria, a kind of "price" for the poor quality of the business environment that must be paid to attract foreign direct investment (FDI) until these issues are solved.

Table 6.3: Firm level weighted average ex-post NPCs on output and raw materials in 2000

Sector	Consolidated NPC Applied by 2000								n'
	Average NPC		Standard Deviation		Max. NPC		Min. NPC		
	Output	Raw Materials	Output	Raw Materials	Output	Raw Materials	Output	Raw Materials	
Food/Beverage	1.495	1.291	0.221	0.186	1.897	1.682	1.124	1.081	14
Textile	1.419	1.177	0.165	0.073	1.650	1.300	1.107	1.085	13
Wood	1.335	1.193	0.049	0.146	1.369	1.296	1.300	1.089	2
Paper/Printing/Publishing	1.293	1.176	0.094	0.063	1.400	1.315	1.120	1.088	15
Plastics	1.273	1.146	0.040	0.028	1.335	1.233	1.198	1.117	13
Metal	1.247	1.142	0.095	0.055	1.428	1.254	1.094	1.011	21
Chemicals/paints	1.205	1.156	0.084	0.088	1.320	1.285	1.120	1.047	5
Non-Metal	1.165	1.113	0.005	0.018	1.168	1.126	1.161	1.100	2
Pharmaceuticals	1.156	1.158	0.052	0.038	1.208	1.201	1.066	1.081	10
Origin of Equity									
<i>Firms with Foreign Equity</i>									
Food/Beverage	1.420	1.304	0.258	0.194	1.838	1.655	1.124	1.111	6
Paper/Printing/Publishing	1.306	1.213	0.084	0.074	1.400	1.315	1.206	1.149	6
Pharmaceuticals	1.200	1.178	na	na	1.200	1.178	1.200	1.178	1
Textile	1.496	1.177	0.095	0.063	1.650	1.253	1.299	1.091	8
Plastics	1.268	1.134	0.042	0.012	1.321	1.145	1.220	1.117	5
Metal	1.247	1.121	0.112	0.059	1.428	1.201	1.094	1.011	11
Non-Metal	1.165	1.113	0.005	0.018	1.168	1.126	1.161	1.100	2
Chemicals/paints	1.191	1.108	0.086	0.086	1.252	1.169	1.131	1.047	2
									41
<i>Pure Local ownership</i>									
Food/Beverage	1.551	1.281	0.185	0.192	1.897	1.682	1.293	1.081	8
Wood	1.335	1.193	0.049	0.146	1.369	1.296	1.300	1.089	2
Chemicals/paints	1.214	1.188	0.101	0.089	1.320	1.285	1.120	1.109	3
Metal	1.247	1.166	0.080	0.040	1.371	1.254	1.150	1.120	10
Pharmaceuticals	1.152	1.156	0.053	0.040	1.208	1.201	1.066	1.081	9
Plastics	1.276	1.154	0.041	0.033	1.335	1.233	1.198	1.126	8
Paper/Printing/Publishing	1.271	1.147	0.103	0.044	1.400	1.234	1.120	1.088	8
Textile	1.230	1.144	0.130	0.077	1.407	1.257	1.107	1.085	4

Source: World Bank, RPED Nigeria 2001.

Memo Item (ECG quoted in Fine 2001).

1995 NPCs on Output	
Food/Beverage	1.370
Textile	1.430
Wood	1.300
Paper/Printing/Publishing	1.170
Metal	1.280-1.160
Chemicals/paints	1.150

Effective Protection of Nigerian Manufacturing

The previous section depicts a distorted structure of nominal protection as of 2000. However, NPCs have not only an impact on the value of a firm's output but also on the cost of its inputs, thus affecting the value-added generated by enterprises.

This effect is usually captured by the Effective Rate of Protection (ERP). In a partial equilibrium setting, the ERP measures the proportional change in an industry value-added attributable to the

tariff structure, relative to a free trade benchmark which is usually proxied by using world prices, or prices from a freer comparable competitor country.²⁶ The magnitude of the ERP depends not only on the tariffs on firm's final product, but also on tariffs on inputs and input coefficients in production. The level and subsequent ranking of sectors by ERPs synthesizes the impact of the overall protective rate structure and is indicative of the possible directions where investors may shift resources between activities. The ERP is defined as:

$$ERP_k = \left(\frac{VA_k^D - VA_k^W}{VA_k^W} \right)$$

for a firm k where: VA_k^D is the value-added at domestic prices or the tariff distorted value-added;

VA_k^W is the value-added expressed at world prices or simulated for the same sector in the absence of trade restrictions.

Thus the ERP indicates to what extent the value-added changes as a consequence of the entire tariff structure, under the assumption that there are few or no NTBs that may cause further distortions. Other things being equal, the ERP is higher the higher the nominal tariffs on output and lower the higher the tariffs on inputs. When computing ERPs, a key question is to properly define the value-added. In what follows, the value-added is assumed to cover labor costs, the profit, and the depreciation of capital.

More precisely, the domestic value-added was computed as the value of total sales minus the cost of raw materials and indirect costs (including oil costs). The value-added at international price was computed the same way.

However, it must be kept in mind that not all inputs are traded (Biggs and Shah 1997a). The degree to which non-traded inputs affect the value-added and the ERP depends on how their price may change as a result of the protection granted to tradables. However, this effect is not clear from a theoretical point of view. If non-traded inputs use mostly traded inputs in their production, which are subject to protection, then their prices will increase. In addition, because traded goods are consumed in their own right, protection can place upward pressure on their prices by way of expenditure-switching effects. Finally, since non-traded goods are also inputs into traded goods, there will be changes in their demand as resources are reallocated from declining to expanding sectors. Depending on substitution possibilities, the effect can be positive or negative. The procedure used for the following computations was to consider non-traded inputs as tradables with a zero tariff (the so-called "Balassa procedure"). Hence, tradables (sales, raw materials costs, and oil costs in the indirect costs) were adjusted using a proper tariff and non-traded elements (the rest of the indirect costs) were affected a zero tariff.²⁷ The results are presented in Tables 6.4 to 6.6.

²⁶ In a general equilibrium setting, the EPC can alternatively be interpreted as the uniform tariff that would have the same impact on the profit of the sector as the actual tariff structure. If technical coefficients are fixed, the partial equilibrium definition is identical to the general equilibrium one (Anderson 1998). The survey data used in this note allow only for a partial-equilibrium type of analysis, thus the usual definition applies.

²⁷ The domestic value of the output of each firm was deflated by a firm level weighted tariff on output, the weights being the share of a product in the total sales. The same procedure was used for estimating the value of raw materials at world prices by relying on a firm level weighted tariff. The non-traded component of indirect costs was affected a zero tariff while oil costs were deflated by their related tariff. The value-added for a firm k was defined as

Like NPCs, the estimated rate of effective protection vary widely across sectors, ranging from roughly 26 percent in the non-metal sector to more than 174 percent in the food and beverage industry (Table 6.4). This wide inter-sectoral pattern of effective protection suggests that the structure of protection is non-neutral in its impact across sectors.

Unlike most studies on protection that rely on fairly aggregated data, the survey data used in this section allow comment on the pattern of protection across firms. Within a sector, the situation of firms with respect to effective protection varies widely, and the intra-sectoral dispersion of ERPs is very large as shown by the sectoral standard deviation and the other statistics. For instance, in the "textile" industry ERPs range from little effective protection (a minimum of 11.1 percent) to a very high level of 374.8 percent. The "Food and Beverage" industry is the sector for which the situation of firms differs the most. Such a wide disparity may be explained by the fact that in LDCs, firms tend to use very different production technologies within the same sector (thus the technical coefficients vary widely from firm to firm). This lead to very different levels of ERPs. However, it is also likely that the dispersion in nominal rates explains a significant portion of this intra-sectoral variability. Finally, changes compared to the situation in 1993 are huge. The ERPs increased in the "chemical/paints" and "food/beverage" sectors while they either remained the same or declined in the other sectors.

Similarly to the level of nominal protection, the level of effective protection granted to firms does not exhibit a clear pattern with respect to the type of ownership of firms (Table 6.5) and the dispersion of ERPs is wide. Regional differences are also large. Firms in the East Region tend to have higher effective protection than firms in the other areas.

the difference between the output P_{jk} ($j=1, \dots, 5$) and the value of inputs ($i=1, \dots, 5$ raw materials plus oil and non-oil indirect costs). In a situation with i multiple inputs of price p_i , of which n are tradable and m non-tradable, the estimating formula for a firm k is:

$$ERP = \left[\frac{P_{jk} - \sum_{i=1}^n a_{ij} p_i - \sum_{i=m-n}^m b_{ij} p_i}{\frac{P_{jk}}{1+t_j} - \sum_{i=1}^n \frac{a_{ij} p_i}{1+t_i} - \sum_{i=m-n}^m \frac{b_{ij} p_i}{1+t_i'}} \right] - 1$$

The previous formula requires a few comments on its assumptions. First, as non traded inputs are treated as traded ones with a zero-tariff ($t_i' = 0$) a slight overestimation of ERPs may occur if the price of these goods is indirectly affected by the protection. However, this effect is usually left out as it is hardly verifiable and predictable. Second, it is assumed that firms use fixed coefficient technology: a_{ij} and b_{ij} . These technical coefficients are assumed to be constant, even if the levels of protection vary (i.e., they are the same whether in a free-trade or protected situation).

Table 6.4: Firm-Level Statistics on ERPs as of 2000 by Sector

	Mean ERP	Standard	Max. ERP 2000	Min. ERP 2000	Mean ERPs
	2000	Deviation			in 1993*
Chemicals/paints	51.0	19.5	80.3	31.2	46.0
Food/Beverage	174.2	140.7	323.5	18.8	107.0
Metal	80.1	62.7	264.8	16.5	89.0
Non-Metal	25.9	8.9	32.2	19.6	50.0
Paper/Printing/Publishing	58.2	31.8	110.8	31.7	86.0
Pharmaceuticals	36.1	34.7	94.6	5.6	na
Plastics	76.1	39.5	153.4	38.2	na
Textile	100.6	136.6	374.8	11.1	101.0
Wood	65.8	na	65.8	65.8	na

* Quoted in Fine (2001).

Source: World Bank, RPED Nigeria 2001.

Table 6.5: Firm-Level Statistics on ERPs in 2000 by Type of Ownership

	Mean ERP	Standard	Max. ERP 2000	Min. ERP 2000
	2000	Deviation		
Firms with Foreign Equity				
Chemicals/paints	44.86	19.27	58.49	31.24
Food/Beverage	149.80	185.26	280.79	18.80
Metal	87.76	75.39	264.85	16.51
Non-Metal	25.91	8.91	32.21	19.61
Paper/Printing/Publishing	67.73	40.75	110.80	31.75
Pharmaceuticals	na	na	na	na
Plastics	91.97	48.76	153.37	38.16
Textile	216.33	224.10	374.79	57.87
Wood	na	na	na	na
Pure Local Ownership				
Chemicals/paints	55.05	22.63	80.31	36.64
Food/Beverage	190.40	146.37	323.49	33.63
Metal	72.52	50.38	159.10	21.24
Non-Metal	na	na	na	na
Paper/Printing/Publishing	48.69	21.32	79.85	33.21
Pharmaceuticals	36.11	34.72	94.56	5.64
Plastics	56.35	7.18	64.29	49.99
Textile	42.73	30.93	73.72	11.07
Wood	65.82	na	65.82	65.82

Source: World Bank, RPED Nigeria 2001.

Table 6.6: Firm-Level ERPs in 2000 by Location

		Average ERP 2000
East Region	Abia	51.09
	Anambra	94.39
	Benue	55.25
	Enugu	44.78
	River	203.30
	East Region	96.84
Lagos and South Region	Kwara	49.99
	Lagos	55.79
	Ogun	71.96
	Oyo	170.98
	Lagos and South Region	66.70
North Region	Jigawa	60.58
	Kaduna	72.17
	Kano	84.20
		North Region

Source: *World Bank, RPED Nigeria 2001.*

Conclusion

Trade policy in Nigeria has mainly consisted of translating a strategy of import substitution into tariffs. Even if the broad aim of reducing overall protection has been reached to some extent, tariffs in Nigeria remain well above world averages.

While the 1995-2001 reform pursued a planned decrease in the overall rate of tariff, it seems to have failed at reducing various distortions. In effect, for many product categories the dispersion in NPCs is still high and actually was increased by the various yearly changes. They also induced an increase in nominal protection for more than a fifth of the tariff categories. Moreover, the nominal protection from which firms benefit is usually higher than what is predicted by computations on the basis of the customs book, due to the fact that they often produce a wide range of products subject to varying tariffs. As before, raw materials tend to be less protected than final products. All of this translates into a very uneven structure of effective protection. Effective protection in 2000 was sometimes higher than in 1993, varies widely across sectors, ownership, and regions.

The picture of the current level of protection in Nigeria is thus mixed. On the one hand, the overall level of nominal protection decreased (to about 25 percent in 2000 from about 30 percent in 1994); on the other hand, severe distortions persist, as indicated by the high value of many standard deviations and the wide range of the ERPs. It is likely that the issue to be addressed first is the dispersion of the tariffs and their year-to-year instability. These undermine the credibility of the trade policy. The tariff level is still an issue, but less critical (with the exception of a few specific products with exorbitant tariffs that should be reduced to a more reasonable level). A major consequence of the present tariff structure is to add uncertainty on the level of protection to the already high uncertainty faced by firms. This provides fertile ground for fraud.

The previous findings suggest a few guidelines for the coming reform of trade policy in Nigeria.

- The current positive trend toward an overall decrease in protection should be pursued. There is ample evidence of the benefits of open trade regimes. For example, Sachs and Warner (1995) have estimated that open economies have grown on average about one percent faster every year than closed economies. To be consistent with the previous decrease and Nigeria's international commitments (WTO and the custom union), the targeted overall nominal protection should be between 10 and 15 percent.
- The excessive current tariffs, set at 100 percent for some goods previously banned from import or subject to import quotas, should be decreased to a more reasonable level in the range of 10-15 percent.
- A critical point is the dispersion in tariffs, which must be reduced. This could be attained by either relying on targeted tariffs that could vary within a limited range or using a single uniform tariff. The usual set of arguments in favor of multiple tariffs is of little relevance for Nigeria,²⁸ and these are not an optimal instrument of taxation.²⁹ In consequence, imposing a uniform tariff is probably an option to investigate further for Nigeria. The arguments in favor

²⁸ The usual arguments in favor of imposing a set of differentiated tariffs rely on:

- i) the eventual monopsony power of a country on some products. If a country imports a significant share of the world's supply for some goods, then an import tariff could reduce the price it must pay to its suppliers and then improve its terms of trade;
- ii) the use of a "strategic" trade policy. When faced with an international oligopoly, some models show (Brander and Spencer 1985) that tariffs could increase the welfare of a country by shifting excess profits from foreign to domestic firms;
- iii) the protection of an infant or restructuring industry. It is often argued that some industries that are currently unprofitable (either financially or economically) may become better off in the indefinite future. Protecting such industries now would, through learning-by-doing effects, help them to become competitive later;
- iv) revenue considerations. It is often argued that import tariffs in least developed countries (LDCs) are an easy way for the government to generate revenues;
- v) attempts at improving the balance of payments. Imposing tariffs may reduce imports and thus improve the balance of payments.

The monopsony argument can be ruled out as there is no one product for which Nigeria imports a large share of the world supply. Arguments of strategic trade policy are in essence theoretical as there is little evidence of excess profits in many industries worldwide and the results of these models are highly sensitive to their assumptions. The infant industry theory is of little relevance. For decades, protection in Nigeria has been above the world average and industry is still underdeveloped. Addressing the various market failures and the source of economywide distortions is usually a better policy than relying on tariffs. Despite the appeal of simplicity, using tariffs to improve government revenues is not optimal. In effect, tariffs are not an optimal instrument of taxation as they distort production and consumption choices. Tools such as value-added tax (VAT) or income taxes are usually more neutral. Imbalances at the level of the balance of payments usually come from excessive domestic absorption or exchange rate misalignment. Using tariffs may provide a temporary relief but do not address the underlying source of the problem. A policy mixing a reduction in absorption (through a tightening in monetary or fiscal policy) and a depreciation of the real exchange rate is likely to have a larger sustainable effect.

²⁹ An income tax is more neutral but is not an optimal tax. The standard model for tax policy analysis (Newbery and Stern 1987) states that an optimal tax induces no changes in the economic behavior of agents. That is, they have no way by altering their behavior to evade tax payment, except by undertaking illegal actions. Hence, an income tax is not optimal as it affects consumption patterns. An optimal tax would be, for example, a lump-sum tax based on a constant characteristic unrelated to any kind of economic behavior. Things are different for LDCs, like Nigeria, where special issues arise and the standard model is difficult to apply. LDCs differ from the classical taxation model because of the existence of an important primary sector, dualism in the society, and segmentation of the labor market. In this case, the issue is more to find the a tax that creates less distortion than an optimal one.

of a uniform/flat tariff usually fall into three categories (Tarr 1998): political considerations, administrative convenience and possible reductions in smuggling.

In terms of political considerations, a flat tariff would reduce the incentive for manufacturers to spend resources in lobbying government for higher tariffs, because by doing so they would only be forcing themselves to bear a higher cost on imported inputs and a face a lower price of exports through a real exchange rate effect. A uniform tariff would thus allow for a reduction in the diversion of resources and contribute to reduced corruption. This would be especially helpful for Nigeria. A uniform tariff is also easy to administer. It allows for custom officials to focus more on the value of imported goods (to avoid under-invoicing fraud) and less on the classification of goods (a single tariff makes useless any attempts to misclassify imported goods to obtain better tariff rates). Finally, it may help to reduce smuggling. A varied tariff structure provides an incentive to illegally import goods subject to high tariffs. If a reasonably low and uniform tariff is applied, there is little rationale for smuggling.

For the reasons above, it is thus suggested that a single tariff in the 10–15 percent range, applied both on raw materials and final goods would be an appropriate tool.³⁰ This would allow for: (i) eliminating the dispersion in tariffs and thus reducing the uncertainty faced by firms; (ii) harmonizing the ERPs by eliminating tariff escalation and thus allowing for an allocation of resources between sectors based on unbiased (or less biased) relative profitability; and (iii) easier administration by custom officials and reducing the incentives for corruption and smuggling.

Finally, trade policy cannot be separated from the macroeconomic context of a country. Of particular importance are developments on the exchange rate front for Nigeria. If any trade policy reform is to have an impact in this country, the prerequisite is to unify the exchange rate market so that incentives become more clear, and the only rational way to bring in goods is to do it officially.

³⁰ It must be mentioned that a kind of median policy between a uniform tariff and a large set of tariffs adjusted for each type of good is not beneficial. Empirical estimates suggest that for the same level of overall nominal protection, the distortionary cost of a single tariff is much lower than the use of two tariffs. For details, see Tarr (1998, 10).

Annex B: Detailed Sub-Sample and Tariff Rate Tables

Table B.1: Structure of the Subsample for Firm-Level ERPs

Sector	Nber	Size	Nber	Region	Nber
Chemicals/paints	5	Very Small	12	East Region	Abia 5
Food/Beverage	5	Small	12		Anambra 4
Metal	18	Medium	22		Benue 2
Non-Metal	2	Large	10		Enugu 2
Paper/Printing/Publishing	8	Very Large	3		River 4
Pharmaceuticals	5			Lagos and South Region	Kwara 1
Plastics	9				Lagos 20
Textile	6				Ogun 5
Wood	1				Oyo 2
				North Region	Jigawa 1
					Kaduna 4
					Kano 9

Source: World Bank, RPED Nigeria, 2001.

Table B.2: Basic Statistics on Scheduled (ex-ante) and Applied (ex-post) Tariffs by 2000

Classification	Initial Schedule - 2000 Consolidated NPC				Consolidated NPC Applied by 2000			
	Average ex-	Standard	Max. NPC	Min. NPC	Average ex-	Standard	Max. NPC	Min. NPC
	ante NPC*	Deviation			post NPC*	Deviation		
01 Live animals	1.204	0.043	1.250	1.125	1.218	0.063	1.317	1.125
02 Meat and Edible Meat Offal	1.250	0.000	1.250	1.250	1.258	0.024	1.327	1.250
03 Fish and Crustaceans,...	1.207	0.089	1.300	1.100	1.204	0.092	1.300	1.098
04 Dairy Produces	1.286	0.128	1.500	1.100	1.289	0.157	1.550	1.090
05 Products of Animal origin not specified elsewhere...	1.389	0.176	1.600	1.100	1.386	0.180	1.600	1.100
06 Lives Trees and Others Plants,...	1.525	0.144	1.650	1.400	1.525	0.144	1.650	1.400
07 Edible vegetable,...	1.400	0.000	1.400	1.400	1.400	0.000	1.400	1.400
08 Edible fruits and nuts	1.400	0.000	1.400	1.400	1.406	0.021	1.480	1.400
09 Coffe,Tea, Mate and Spices	1.332	0.057	1.450	1.230	1.332	0.057	1.450	1.230
10 Cereals	1.414	0.377	2.000	1.150	1.445	0.335	2.000	1.150
11 Products of the milling industry	1.453	0.059	1.600	1.400	1.418	0.103	1.600	1.200
12 Oils seeds and Oleaginous Fruits	1.150	0.080	1.300	1.000	1.160	0.071	1.300	1.100
13 Lac, gums, resins,...	1.150	0.000	1.150	1.150	1.150	0.000	1.150	1.150
14 Vegetable Plaining material	1.150	0.000	1.150	1.150	1.150	0.000	1.150	1.150
15 Animal or Vegetable Fat and Oils	1.274	0.087	1.400	1.150	1.288	0.148	1.650	1.050
16 Preparation of Meat, of Fish,...	1.412	0.027	1.461	1.400	1.412	0.027	1.461	1.400
17 Sugar and Sugar Confectionery	1.263	0.111	1.400	1.150	1.245	0.108	1.400	1.150
18 Cocoa and Cocoa Preparation	1.308	0.074	1.450	1.250	1.308	0.074	1.450	1.250
19 Preparation of Cereals	1.393	0.138	1.600	1.217	1.410	0.161	1.640	1.200
20 Preparation of Vegetables, Fruits,....	1.417	0.035	1.500	1.400	1.423	0.039	1.510	1.400
21 Miscellaneous Edible Preparation	1.306	0.089	1.388	1.150	1.288	0.080	1.350	1.150
22 Beverage, Spirits and Vinegar	1.672	0.231	1.900	1.300	1.744	0.287	2.000	1.225
23 Residue and Waste from the Food Industry	1.214	0.063	1.350	1.150	1.214	0.063	1.350	1.150
24 Tobacco and Manufactured Tobacco Substitutes	1.583	0.375	1.800	1.150	1.561	0.358	1.800	1.150
25 Salt, sulfur, earths and stone...	1.173	0.082	1.550	1.100	1.170	0.083	1.550	1.050
26 Ores, slag and ash	1.110	0.020	1.150	1.100	1.107	0.024	1.150	1.050
27 Mineral, fuels, oils ...	1.216	0.070	1.300	1.150	1.208	0.071	1.300	1.100
28 Inorganic chemicals...	1.160	0.041	1.400	1.150	1.153	0.041	1.400	1.100
29 Organic chemicals	1.144	0.016	1.157	1.100	1.140	0.019	1.150	1.083
30 Pharmaceutical products	1.194	0.014	1.200	1.167	1.194	0.014	1.200	1.167
31 Fertilisers	1.100	0.000	1.100	1.100	1.095	0.007	1.100	1.088
32 Tannings or dyeing extracts	1.259	0.132	1.450	1.150	1.219	0.124	1.450	1.033
33 Essential oils and resinoids	1.374	0.171	1.600	1.150	1.374	0.171	1.600	1.150
34 Soap, organic surface-active agents	1.286	0.135	1.450	1.150	1.286	0.135	1.450	1.150
35 Albuminoidal substances...	1.261	0.061	1.375	1.200	1.246	0.037	1.300	1.200
36 Explosives, pyrotechnic products	1.275	0.151	1.500	1.150	1.292	0.183	1.600	1.150
37 Photographic or Cinematographic Goods	1.189	0.049	1.250	1.150	1.173	0.041	1.250	1.150
38 Miscellaneous Chemical Products	1.177	0.042	1.250	1.150	1.151	0.050	1.250	1.050
39 Plastic and Articles Thereof	1.216	0.076	1.350	1.150	1.208	0.081	1.350	1.113
40 Rubber and Articles Thereof	1.286	0.082	1.450	1.150	1.273	0.088	1.450	1.150
41 Raw Hides and Skin	1.236	0.092	1.300	1.100	1.236	0.092	1.300	1.100
42 Articles of Leather	1.283	0.140	1.500	1.150	1.283	0.140	1.500	1.150
43 Furskin and Articial Fur	1.288	0.095	1.350	1.150	1.288	0.095	1.350	1.150
44 Wood and Articles of Wood	1.290	0.090	1.550	1.100	1.290	0.090	1.550	1.100
45 Cork and Articles of Cork	1.175	0.029	1.200	1.150	1.175	0.029	1.200	1.150
46 Manufacture of Straw, of Esparto,...	1.350	0.071	1.400	1.300	1.350	0.071	1.400	1.300
47 Pulp of Wood and Other Cellulosic Materials	1.100	0.000	1.100	1.100	1.098	0.005	1.100	1.088
48 Paper and Paperboard	1.215	0.078	1.400	1.150	1.193	0.094	1.400	1.050
49 Printed Books, Newspapers,...	1.186	0.198	1.450	1.000	1.180	0.198	1.450	1.000

* Unweighted

Source: Author's computations on the basis of FGoN (2001).

Table B.2 (continued)

Classification	Initial Schedule - 2000 Consolidated NPC				Consolidated NPC Applied by 2000			
	Average ex-	Standard	Max. NPC	Min. NPC	Average ex-	Standard	Max. NPC	Min. NPC
	ante NPC*	Deviation			post NPC*	Deviation		
50 Silk	1.257	0.113	1.450	1.150	1.257	0.113	1.450	1.150
51 Wool, Fine or Coarse Animal Hair	1.277	0.120	1.450	1.150	1.277	0.120	1.450	1.150
52 Cotton	1.438	0.107	1.550	1.300	1.439	0.108	1.560	1.300
53 Other Vegetable Fibers, paper yarn,...	1.232	0.087	1.350	1.150	1.216	0.099	1.350	1.075
54 Man-Made Filaments	1.350	0.093	1.500	1.300	1.353	0.098	1.517	1.300
55 Man Made Staple Fibres	1.344	0.103	1.500	1.250	1.328	0.123	1.500	1.100
56 Wadding, Felt, and Nonwovens	1.311	0.060	1.400	1.250	1.307	0.066	1.400	1.213
57 Carpets and Other Textile Floor Coverings	1.450	0.000	1.450	1.450	1.510	0.089	1.650	1.450
58 Special Woven Fabrics	1.332	0.096	1.450	1.250	1.365	0.144	1.650	1.250
59 Impregnated, Coated, Covered or Laminated Textile	1.250	0.050	1.300	1.150	1.245	0.057	1.300	1.150
60 Knitted or Crocheted Fabrics	1.400	0.000	1.400	1.400	1.429	0.009	1.436	1.423
61 Articles of Apparel and Clothing Accessories	1.500	0.000	1.500	1.500	1.504	0.016	1.563	1.500
62 Articles of Apparel and Clothing Acc. not Knitted or Crocheted	1.500	0.000	1.500	1.500	1.500	0.000	1.500	1.500
63 Other Made up Textile Articles	1.402	0.086	1.500	1.300	1.406	0.092	1.542	1.300
64 Footwear, Gaiter and the Like,...	1.342	0.020	1.350	1.300	1.369	0.022	1.400	1.350
65 Headgear and Part Thereof	1.250	0.050	1.300	1.200	1.250	0.050	1.300	1.200
66 Umbrellas, Sun Umbrellas,...	1.350	0.050	1.400	1.300	1.350	0.050	1.400	1.300
67 Prepared Feather and Down	1.350	0.100	1.400	1.200	1.350	0.100	1.400	1.200
68 Articles of Stone, Plaster, Cement, ...	1.343	0.042	1.400	1.250	1.342	0.044	1.400	1.250
69 Ceramic Products	1.346	0.142	1.500	1.100	1.355	0.147	1.500	1.067
70 Glass and glassware	1.313	0.087	1.500	1.150	1.300	0.085	1.500	1.150
71 Natural or Cultured Pearls, Precious or Semi Precious Stones	1.622	0.081	1.650	1.400	1.622	0.081	1.650	1.400
72 Iron and Steel	1.166	0.048	1.250	1.100	1.165	0.048	1.260	1.100
73 Articles of Iron or Steel	1.317	0.088	1.450	1.150	1.316	0.090	1.450	1.150
74 Copper and Article Thereof	1.192	0.058	1.250	1.100	1.187	0.064	1.250	1.100
75 Nickel and Article Thereof	1.156	0.062	1.250	1.100	1.156	0.062	1.250	1.100
76 Aluminium and Article Thereof	1.270	0.088	1.350	1.100	1.267	0.089	1.350	1.100
78 Lead and Article Thereof	1.167	0.068	1.250	1.100	1.167	0.068	1.250	1.100
79 Zinc and Article Thereof	1.164	0.063	1.250	1.100	1.143	0.084	1.250	1.050
80 Tin and Article Thereof	1.221	0.049	1.250	1.150	1.221	0.049	1.250	1.150
81 Other Base Metals	1.120	0.015	1.150	1.100	1.120	0.015	1.150	1.100
82 Tools, Implements, Cutlery, ...	1.348	0.072	1.400	1.150	1.341	0.069	1.400	1.150
83 Miscellaneous article of base metal	1.319	0.084	1.450	1.200	1.321	0.081	1.450	1.200
84 Nuclear Reactors,...	1.133	0.059	1.450	1.050	1.135	0.061	1.464	1.088
85 Electrical, Machinery and Equipments and Parts thereof	1.198	0.057	1.333	1.100	1.197	0.054	1.313	1.100
86 Railway or Tramway Locomotives	1.157	0.088	1.450	1.100	1.156	0.085	1.450	1.100
87 Vehicules other than Railway	1.203	0.086	1.350	1.100	1.195	0.088	1.350	1.050
88 Aircraft, Spacecraft and Parts Thereof	1.200	0.197	1.550	1.100	1.190	0.204	1.550	1.050
89 Ships, Boats and Floating Structure	1.131	0.088	1.350	1.100	1.131	0.088	1.350	1.100
90 Optical, cinematographic, measuring, ... equipment	1.120	0.043	1.250	1.100	1.120	0.043	1.250	1.100
91 Clocks and Watches and Parts Thereof	1.236	0.023	1.250	1.200	1.236	0.023	1.250	1.200
92 Musical Instruments	1.244	0.017	1.250	1.200	1.244	0.017	1.250	1.200
93 Arms and Ammunitions	1.286	0.024	1.300	1.250	1.286	0.024	1.300	1.250
95 Toys, Games, ...	1.288	0.088	1.500	1.250	1.288	0.088	1.500	1.250
96 Miscellaneous Manufactured Service	1.294	0.130	1.550	1.100	1.285	0.142	1.550	1.050
97 Works of art, collector pieces and antiques	1.500	0.000	1.500	1.500	1.500	0.000	1.500	1.500

* Unweighted

Source: Author's computations on the basis of FGoN (2001).

7. Business Problems and Uncertainty

One of the most remarkable findings of the RPED survey is the high level uncertainty and lack of confidence expressed by managers in interviews. Firms in most countries are generally willing to make predications about future sales and investment plans and are usually optimistic about long run sales. It is reasonable for them to be optimistic, otherwise they would be considering leaving the industry in search of more profitable opportunities. However, in Nigeria managers appeared to be much more hesitant to venture forecasts of future economic conditions or to make predictions of high growth.

In our sample, about 79 percent of firms estimated that sales would increase in the next year and about 10 percent expected them to decline. Two firms said they expected to close in the next year. Almost 10 percent said that the sales would not change or could not make predictions. Since managers who are not optimistic are usually hesitant to voice predictions, it is probable that many of those saying they could not answer did not admit that they expect sales to fall. When asked about the long run, sales over the next three years, managers' willingness to estimate sales growth declined significantly and almost 20 percent of firms were unable or unwilling to predict whether sales would grow, fall or remain unchanged. In these cases most managers said that the business environment was too unstable for them to hazard a guess on future sales.

Table 7.1: Percentage of Firms Reporting Expected Sales Changes

	In One Year	In Three Years
Lower than today or closing	10.1	4.9
No change	5.7	2.6
Higher than today	78.9	72.3
No Prediction	4.4	19.4

There is a significant difference in expected sales between sectors. Looking at expected changes in the next three years, more than 84 percent of firms in the food and beverage sector expected higher sales, while less than 60 percent in the wood and textile sectors expected sales to increase. The median expected increase in sales was 82.5 percent for enterprises in the paper sector but only 15 percent wood. The strong confidence expressed by the food and beverage and paper sectors reflects their belief that consumer demand will continue to rise with the growing population. The high shipping cost of most products in this sector provide firms with natural protection from imports. The textile and apparel group contains tanneries who have seen sales grow recently. When leather firms are removed from this group the median expected sales growth over three years falls to only 32.5 percent. The low expected sales growth of textiles probably reflects the competitive pressure from growing low-cost imports. The uncertainty faced by the textile industry is further illustrated by the fact that over 30 percent of textile firms would not predict which way sales would go in the next three years.

Just over 70 percent of firms in the sample reported planning to make significant investments in the upcoming year while 56 percent said they planned to make significant investments in the next three years. Again, as we move the time horizon out, fewer managers feel able to make

predictions. While only nine firms could not say whether they plan to invest in the next year, more than 21 percent were unable to answer about the next three years, saying it depended on government policies and market conditions. The textile and wood sectors show the least propensity to invest, which corresponds with their low expected sales growth. The food and beverage sector has highest sales expectations and the largest proportion of firms planning to invest.

Table 7.2: Firms' Expected Sales and Investments

	% Expecting Sales Increase in Next 3 Years	Median % Increase Expected in 3 Years	% Planning to Invest in Next Year	% Planning to Invest in Next 3 Years
Chemical + Paints	73.1	50	73.1	53.9
Food	84.9	60	778.9	72.7
Metal	72.8	50	68.2	61.4
Paper	76.0	82.5	68	52
Pharmaceuticals	66.7	50	76.2	52.4
Plastic	79.3	65	69	62.1
Textile	55.9	47.5	70.6	41.2
Wood	60	15	60	50
Non-Metal	80.0	30	40	20
Full Sample	72.3	50	70.5	56

When firms were asked whether it is a good time to invest in Nigeria the patterns were very similar. Over 87 percent of food and beverage firms who answered the question believed that it was a good time to invest, while less than 55 percent of the textile firms believed so. Almost 30 percent of the total sample said that it was not a good time to invest in Nigeria. A further 7 percent said that it was not a good time to invest, but they had to invest to survive, or that it was only a good time to invest if you are already established in Nigeria. The vast majority of respondents who said it was a bad time to invest cited the poor business environment caused by inadequate infrastructure and highly uncertain government policies. More than half of the firms saying it was a bad time to invest specifically referred to uncertainty and the inability to plan. At the same time very few of the pessimistic firms mentioned low demand or market forces. This suggests that managers generally believe that they can prosper if the business environment is improved. More firms in Lagos and in the North cited uncertainty than in the east. It is not clear why this is. It could be the nature of the businesses or that the state and local governments in the east are easier to work with.

Foreign-owned firms were much more negative about the investment climate than indigenous firms. Almost 50 percent of firms with significant foreign ownership said that it was either a bad time to invest or that only firms already in the markets should attempt it. Foreign owned firms were also more likely to cite uncertainty and not market conditions as the reason not to invest. Almost 30 percent of the largely foreign-owned firms, three times the proportion of indigenous firms, said that the unstable business environment makes it a bad time to invest.

However, it is not all bad news. Over 60 percent of the sample said it was a good time to invest. Most of these firms argued that the market opportunities and the current government's

commitment to reform make them optimistic despite the poor infrastructure and the past political upheavals. It is interesting to note that almost 85 percent of the firms in the east, compared to just 56 percent of firms in the Lagos area, believe that it is a good time to invest. It might be that firms in the East are less affected by government policies; however, most firms in the east specifically stated that the advent of democracy has given them encouragement.

Uncertainty

The high level of uncertainty and general lack of security was a recurrent theme for all of the respondents. Managers consistently stated that they are unable to plan and hesitant to risk investing because they cannot predict what government policy will be. When firms were asked their three biggest problems doing business uncertainty and inability to plan because of fluctuations in government policies ranked third, behind lack of infrastructure and access to finance. Uncertainty was twice as important as the next major problem, inadequate demand. Few firms said they made business plans beyond a year and many firms said that their market plans were generally two to three months.

The survey data show just how inconsistent firms believe government policy is. When asked to rank the government on a scale of one to five, where one is completely predictable and five is completely unpredictable, more than 55 percent of firms ranked the government as either a four or a five. Less than 18 percent ranked it as predictable, giving it a one or two. When asked if they expect the government to make policy changes in the next year that materially affect their business without consulting them, more than 63 percent of the respondents said yes. This high level of mistrust was evident across all regions and sectors.

Enterprises attempt to insulate themselves from the vagaries of government bureaucracy as best they can. For example, the majority of firms that we spoke to who sell to the government do so through contractors so they do not have to deal with the corruption and the difficulties in collecting payment. Many firms do not attempt to fight through the bureaucracy and corruption associated with export and sell to traders and middlemen who export for them. Others do not apply for tax incentives, training funds, and other benefits to avoid dealing with the government. However, no firm can avoid being dramatically affected by erratic government policies and laws. A few examples illustrate the challenges firms face from unpredictable government actions.

- One large firm has two generators sitting on the dock on the UK accumulating shipping charges while awaiting permission from NEPA to import them. They were ordered before the regulation requiring NEPA permission was enacted.
- The last budget reduced the tariff on a certain type of thread used by a textile company. The company ordered a large shipment. When it arrived at the port, the company learned that the tariff reduction was rescinded at the end of January and the change was not publicized. Consequently, the shipment cost over 50 percent more than expected.
- Export incentives were extended to raw cotton and the duty rate on gray cloth was dropped. This led cotton producers to export large quantities of raw cotton. The duty rates on gray cloth were then raised to 68 percent in response to lobbying from a few large

cloth producers. By this time much raw cotton had been exported, so there was a shortage of domestic cotton and cotton cloth was expensive to import.

- Almost all firms were dramatically affected when the minimum wage was more than doubled without prior notice or consultation with the business community. The increase threw off all cost predictions for many enterprises.

To make successful business plans, managers must be able to make reasonable predictions about the macroeconomic environment and how it will affect their enterprises. Unfortunately, firms in Nigeria find it very difficult to make such predictions. When managers were asked which direction interest rates would move in the next year, 53 percent said that they believed that rates would continue to rise, but over 20 percent said that they could not venture a prediction. When asked about the long term, over 50 percent were unable to make predictions of the direction of movement in the next three years. Only a few firms, just over 17 percent, believed that rates would fall in the long term. It was a similar story for predictions about the movement of prices and the value of the Naira. Over 60 percent of the sample believed prices would continue to rise and the Naira to devalue over the next year, and around 20 percent could not make a prediction. But when asked about movements over the next three years, more than half the firms could not answer. This was consistent for all types of firms in all regions. The unstable macro environment, especially the exchange rate volatility, is a major reason that firms in Nigeria are unable to plan and unwilling to make large investments.

Though it remains a highly volatile business environment, the new Nigerian government has made great progress in eliminating many regulations that were burdensome in the past. Very few firms complained about labor laws, receiving business permits, obtaining foreign exchange, bringing in capital, or repatriating profits. Not that these areas are without problems. Every action with government officials requires payment and depending on one's relations with the officials, and obtaining any official permission can be painfully slow. It is still a time-consuming and bureaucratic process to obtain an expatriate quota, and the way in which the minimum wage was recently increased came in for bitter criticism. In some locales it is still a difficult process to get clear title to land. However, generally the labor laws, business licensing, and capital flows were not viewed by a significant number of firms in any region as a major problem.

Despite the recent improvements, the regulatory environment remains problematic and is an important cause of the uncertain business environment. Most regulations and laws change frequently or are inconsistently applied causing firms to expend considerable time and effort to comply with them or negotiate ways around them. There is a multitude of regulations imposed by all levels of government, so it is not possible to list all of them. But some problems were cited more often than others. Among the most frequently mentioned regulations was the recent requirement to obtain NEPA permission to import generators. Since generators are a necessity to operate in Nigeria, it affected every firm. Most firms saw it as nothing more than a blatant way for NEPA officials to seek bribes.

The Standards Organization of Nigeria (SON) and the Nigerian Food and Drug Administration (NAFDAC) were frequently mentioned as sources of burdensome regulations. Managers repeatedly stated that neither organization appears to have the capabilities needed to adequately

perform their regulatory roles. Therefore, instead of protecting industry and consumers they serve more as a way to harass businesses and seek bribes. It is reported that SON does not have its own testing facilities and often relies on test results provided by the firms they are regulating. Nigeria does not have its own standards for many products, so there is little value in testing in Nigeria and not accepting reports from the country of manufacture on imported products. It takes an inordinate amount of time to register products through NAFDAC. For example, one pharmaceutical firm said that it takes up to one year to register a new product. Since they introduce as many as four new products a year, they cannot wait that long. Consequently they begin marketing new products before they are registered but do not advertise them. It is beyond the scope of this survey to assess the abilities of these regulatory agencies, and this portrayal may not be accurate. However, it is a common perception among many of the firms that we interviewed that these agencies are not competent and function more as a source of graft than a proper regulatory body.

The state and federal environmental agencies were also a major source of complaint. All managers recognize the need for environmental regulations, although some are more willing to bear the cost than others. However, the environmental protection agencies are viewed as incapable of adequately protecting the environment and are a significant burden on the manufacturing sector. The regulatory agencies are seen to come down and levy fines and fees and demand that firms clean up their operations. However, they appear unable to offer technical assistance to help firms meet environmental requirements. Complying with many of environmental regulations is beyond the means of many manufacturing firms, especially small ones, and consequently they are avoided by paying bribes. In addition to meeting standards, the reports required by the environmental protection agencies are very expensive and require hiring technical experts, yet firms see no value in them.

The state environmental agencies are seen as particularly heavy handed in their operation. In Kano recently, the Kano Environmental Protection Agency ordered tanneries and textile firms to pay large levies for pollution. They gave very little time for the companies to respond and then used police to close down several firms until a payment was made. Such capricious actions by regulators adds considerably to the uncertainty of doing business and heightens the risk in an already risky environment.

As in many other countries, most of the actual laws and policies in Nigeria are reasonable, and their value is understood by most of the manufacturing sector. However, the value of many regulations is lost when they are implemented in an arbitrary and capricious manner. This leads them to be relatively ineffective, yet they add considerably to the risk and uncertainty in the business environment. The only reason that they did not come under more extensive criticism is that most regulations can be avoided through negotiation, bribery, and political connections. In addition, managers are focused on the more pressing problems of infrastructure and access to capital. However, the regulatory regime is a daunting problem, particularly in attracting foreign investment.

Crime and security are a significant issues facing every person and enterprise in Nigeria. More than 15 percent of the sample cited crime and security among the top three problems doing business in Nigeria. When asked to rate crime as a cost of doing business on a scale of one to

five, close to 27 percent of the sample ranked it as a serious problem giving it a four or five. There is a marked difference in the perception of crime between regions and between foreign and domestic firms. Over 30 percent of firms in Lagos rated crime as a four or five, compared to around 21 percent in the east or north. Among firms with significant foreign ownership, 22 percent cited crime among the top three business problems, double the proportion of indigenous firms. Nearly 43 percent of foreign firms ranked crime as a serious cost of doing business compared to less than 17 percent of indigenous firms.

Table 7.3: Firms Citing Crime as a Problem

	% Citing Crime among the Top 3 Business Problems	% Giving Crime a 4 or 5
East	6.4	21.28
Lagos	16	32.18
North	20	21.05
Foreign	22.2	42.9
Indigenous	10.6	16.7
Full Sample	15.5	26.6

Table 7.4: Firm Opinions about Investment

	% of Firms Saying It Is a Good Time to Invest	% of Firms Saying That Uncertainty Makes It a Bad Time to Invest
East	84.8	4.4
Lagos	55.6	23.1
North	61.5	15.4
>20% Foreign Ownership	52.5	30
Indigenous	69.6	9.6

The government's inability to provide security imposes many costs upon the manufacturing sector. Some are measurable, such as the amount of money firms spend hiring security guards. Others are impossible to measure but probably impose a much higher costs. For example, in interviews managers consistently said that they could not visit their factories at night. They also said that providing security for the expatriates dramatically increased the costs of bringing in technical experts and made many foreign consultants unwilling to work in Nigeria. Many firms had been attacked by armed robbers. Consequently, few firms kept cash on hand, a significant difficulty in an economy that functions almost entirely in cash. Some firms said that because of the threat of robbery and theft firms restrict where they will directly market their products, thus shrinking the size of their potential market.

The lack of security is a major factor discouraging foreign investors. As seen in the tables above, foreign-owned firms and those with expatriate managers were far more likely to cite crime and security as a major issue than were indigenous firms. Several managers said that they had trouble attracting potential foreign partners because of the poor reputation of Nigeria and because they were unwilling to travel to the country. In addition, security appears to be a bigger concern in Lagos, the place where new foreign investors are likely to make their first visit.

Poor security and the inefficient legal system have other economic effects. Several firms stated that the poor reputation of Nigeria internationally makes it more difficult for them to open letters of credit or to enter into deals with foreign firms. They have to make payment in advance and spend more on guarantees, further burdening their limited supply of working capital. The lack of an efficient legal system makes it difficult to extend trade credit or to establish business relations with new clients.

Few firms have trouble with their labor unions. Only 12 percent of firms reported having trouble of any kind with their labor unions, and the mean number of days lost to strikes was only 2.3 days with more than half of the sample reported losing no days to strikes. Over one-third of firms reporting labor problems were in the textile sector, which is known for having very strong unions. The mean number of days lost to strikes in the textile sector was 6.6, more than twice the sample average. Most of the reported labor disputes were very short lived, and most strikes were not specific to the firms but those called by national unions. Few firms ever mentioned labor problems as a significant problem, and overall it does not appear to contribute to the difficult business environment. This may be due to the high unemployment and the high wages, to which managers also attribute the very low absenteeism rate.

Taxes

The risk and uncertainty in the Nigerian business environment is heightened by the tax regime. Although taxes rank well below questions of infrastructure and finance, they are still an important constraint on doing business and are mentioned among the top three business problems by more than 11 percent of the sample. While some tax policies and laws are poorly designed, a much more severe problem is the arbitrary and capricious manner taxes are administered. The overall tax burden reported by firms in the sample is relatively low; the mean is below 10 percent for both public and private limited firms. But the transaction costs firms incur trying to comply with and avoid the complicated tax system are substantial. Several managers candidly remarked that they could avoid paying a high amount in tax and that the real burden came from the time and aggravation spent dealing with tax matters and not being able to plan for what their tax burden would be.

Table 7.5: Tax Burden

	Tax/Sales	Tax/Profit
<i>Public LTD</i>		
Mean	.059	.098
Median	.039	.063
<i>Private LTD</i>		
Mean	.050	.093
Median	.025	.019

Only firms reporting paying positive income tax were included, so firms with pioneer status and other major tax exclusions are not included.

The constant refrain heard throughout all region and from all types of firms is that the multiplicity of taxes is among the most frustrating challenges facing firms in Nigeria. Most of

this problem stems from the wide variety of constantly changing taxes and levies imposed by the state and local governments. Manufacturing firms are seen as a lucrative target for state and local governments struggling to raise revenue, and they are constantly being bombarded by different levies. One small firm, located in the heart of a major city, took down its sign board because as its manager said “a manufacturing firm in the city attracts tax collectors.” Most levies are not large by themselves, but they all require extended negotiations with tax collectors, they are not predictable, and their cumulative value can be substantial. It is so difficult for firms to know which levies are valid and which are just tax officials seeking to raise revenue that the Chamber of Commerce in one state was forced to create a list of valid state taxes and to distribute it to its members. But even this effort could not to keep current with the changes.

Many local levies overlap with federal taxes or with other state and local levies. The most notorious example is the Lagos State Sales tax that is applied on top of the federal VAT. Other overlapping taxes include local premises taxes, ground rent, and federal and state education taxes. The sign board and mobile advertising taxes came in for particular scorn since they are seen as trivial and little more than harassment. Many managers stated that they particularly resented paying state and local taxes because they could not see their benefits since services were so bad.

The state governments’ use of tax consultants has reportedly stopped. But their legacy lives on in firms’ distrust of the state tax collectors. Tax consultants were independent auditors who were hired to audit firms’ past tax records and then levy back taxes. Most managers believe that since their pay was based on the amount of revenue they raised for the state, they had the incentive to overstate taxes. To this end they did not always follow the law, and, except for negotiating directly with the consultant, firms had little recourse to dispute the consultants findings. For example, in one state, tax consultants were only allowed to look back at the past three years. However, several firms said that they went back more than five years until they could find cause to raise sufficient money. The main target of the tax auditors was employee withholding taxes, such as the Pay As You Earn (PAYE) tax and industrial training fund (ITF). If it was determined that a firm did not withhold enough tax, the firm was liable for both the employees’ and the firm’s share, because the workers would not tolerate having deductions made from their current wages for payroll taxes in previous years. Thus, the burden was carried entirely by the firm. When firms are subject to such arbitrary taxation, it becomes very difficult to estimate costs and make sound business decisions.

Among the taxes cited as particular problems was the PAYE tax. The main issue here is that tax officials do not accept firms’ payroll records for expatriates and levy tax based upon “best of judgment.” The tax officers argue that many firms do not report that they pay some expatriate wages abroad. Thus, the tax authorities judge the income of expatriates and levy PAYE tax based upon their nationality no matter what records the firm has. This is seen as a severe form of harassment by many firms. They claim that they accurately report the salaries paid expatriates and that the best of judgment system significantly increases the cost of bringing in technical experts, which is already very expensive because of the cost of providing security, transportation, and a wage high enough to attract expatriates to Nigeria.

The most often criticized tax was the Withholding Tax (WAT) levied by the federal government. This tax requires buyers to withhold five percent of the value of a contract and remit it to the government as an advance payment on the seller's income tax. The WHT is poorly administered and adds to the strain on firms already weak cash flow. Though the tax is supposed to be levied only on contract, that is broadly interpreted and any bill of sales is seen as a contract. A firm can go to a supplier and buy a good for cash from the supplier's premises and not pay WHT. However, if the buyer delivers it, then the WHT tax usually has to be collected. WHT is a problem because many companies, especially small companies, either do not remit the funds to the government or delay remitting the funds. Consequently the seller does not get a tax certificate or does not get the certificate in a reasonable time and can not claim the payment on its corporate tax. Usually sellers react by raising prices of their goods by five percent. There is also a cascading effect to the WHT. If the buyer does not provide a tax certificate then tax withheld is considered part of the price of the good and the seller must pay VAT on this portion of the price, even though it never received the funds. WHT tax is a significant issue and almost 30 percent of the overall sample mentioned it as an important tax problem. The only way to stop WHT tax from being collected, even in cases where it should not be, is to obtain a certificate from the Inland Revenue Service in Abuja and this is very hard to do. One firm even claimed that it was forced to remit WHT payments to a foreign based firm for goods it imported.

The administration of VAT was criticized by even more firms than WHT. In Nigeria VAT functions more as a sales tax than a true VAT because firms are unable to claim much of the VAT that they pay. VAT must be paid on all capital goods and inputs such as energy and fuel, yet these cannot be claimed by the manufactures. In addition, many firms stated that on imported goods the VAT they paid included the customs duty and port charges. Since much VAT cannot be reclaimed, there is a cascading effect, in which sellers include the cost of VAT in the price of their goods and then the buyer must pay VAT on the VAT.

The inefficient tax administration forces manufacturing enterprises to devote considerable management resources to dealing with the tax regime. Also the poor design of the VAT, WHT, and PAYE reduces the amount of funds firms have for investment and day-to-day operations. The tax regime may also serve as a discouragement to foreign investment. In a very complicated system where the tax code is not understood or closely followed, there is much room for negotiation. In such a system, new firms and foreign firms would be at a disadvantage because they are not as politically connected or knowledgeable on how to navigate the bureaucracy. The complications of the tax system were one of the reasons cited by firms saying that it is not a good time to invest unless you are already established in Nigeria. Many of the tax administration laws seem to affect expatriates more than locals as illustrated by the problems with PAYE.

In recent years there has been some movement to improve tax administration. It appears that the practice of using police or soldiers to shut down firms during tax disputes has ceased. Only 26 firms in our sample reported ever being closed over a tax dispute and almost all of these occurred during the military regime. Firms report that recently the states have quit using independent tax consultants, but managers are still subjected to frequent visits by tax officials seeking payments of various kinds. However, they are no longer worried about visits by tax consultants seeking to audit returns and payroll taxes from several years back or about the sudden arrival of police to shut down the factory over a tax dispute.

Because the government does not inspire confidence in either the workers or managers, payroll taxes to fund programs such as the National Social Insurance Trust Fund (NSITF), the housing fund, and the ITF are seen as little more than additional income tax. No worker or manager we spoke with believed that they would see the benefits of the NSITF or the housing fund. Very few firms said that they were able to access and use the ITF. Generally, firms did not believe that they would see the benefits of any levies ranging from the NSITF to education levies, and this was particularly true for state and local taxes. Consequently, firms seemed to particularly resent these taxes.

The Nigerian government offers a wide variety of investment incentives for the manufacturing sector. Unfortunately, the results of the survey suggest that they make little if any practical difference. When asked if the tax system affects their investment decisions, only six firms said that tax incentives influenced them to increase investment or exports and even these companies said that the incentives were not a major factor. What is interesting is that only 20 other respondents said that the tax system inhibits investment because it reduces their cash flow. The vast majority of firms reported that the taxes do not enter into their decision to invest, suggesting that most firms have found ways to avoid paying taxes and to cope with the administrative problems. Managers repeatedly stated that you could not depend upon the government to actually implement incentives. When they are implemented they are usually too late to be any value. Consequently, some managers did not even bother to learn what incentives were available. In several cases managers knew they were eligible for incentives such as pioneer status but did not think it was worth the time and effort of applying. One reason for this result might be that, in the words of one manager, many business are able to “negotiate personal tax exemptions” with the tax officials. Among the most prevalent incentives are the export expansion grants, pioneer status, and investment tax allowance, and managers said these were useful. But managers view tax incentives as a bonus, but not something reliable enough on which to base plans.

The multiplicity of taxes and the poor design and administration of some taxes contribute to the risk and uncertainty of business in Nigeria. The tax system requires managers to devote a large amount of resources to dealing with administration, and its inefficiency reduces firms stock of working capital. The tax regime is a particular concern to foreign-owned firms and those that employ significant numbers of expatriates. This almost certainly helps discourage foreign investment and technology transfers. However, as a business problem, taxes rank well below other issues such as infrastructure, access to finance, and policy stability. Most firms do not face a large tax burden and are able to cope with the administrative problems. Because firms are able to avoid many taxes and because the laws are administered so inefficiently, incentives designed to spur investment appear to have little effect.

8. The Cost of Electricity

Introduction

Nigerian firms complain about increasing competition from imported goods and commonly place much of the blame on the high cost of manufacture. They report that their most serious business problem is the state of infrastructure, and the biggest infrastructure problem is electricity. This paper sets out to show why this is so.

In undertaking the research into the supply of infrastructure, all 232 firms were asked a short series of questions; in the case of a small sample of firms, a more detailed investigation was undertaken in which NEPA bills were examined and the costs of self-generated power were generally validated by putting the same questions to several managers. Firms in Nigeria feel very hostile to NEPA, the electricity provider, and commonly provide knee-jerk reactions to questions about electricity. This paper, particularly in the case of the smaller sample, seeks to look deeper into the electricity deficiencies than provided by the instant reactions of firms.

In considering the cost of electricity, one has to bear in mind that in both the case of publicly- and privately provided power, the prices are distorted by government subsidy. In the case of publicly provided power, it is reported that NEPA produces electricity at a relatively high cost of 11 UScents/KwH compared to an international average of about 5-6 cents/KwH. The company is allowed to charge only 3.5 cents/KwH with the rest supposed to come as a government subsidy. Yet NEPA's account receivables run into billions of Naira as private and public consumers fail to pay—sometimes due to frustrations with the poor service and often inaccurate billing (DFID 2000). In the case of privately provided electricity, there is a government subsidy too, as some 75 percent of the cost is represented by the cost of fuel that benefits from subsidy.

The Incidence of Electricity Deficiencies by Firm Size, Region, and Sector

Virtually all the firms have the facility to generate their own power as shown in Table 8.1. About 93 percent of the smallest firms (20-49 employees) surveyed do; some 97 percent of the small firms (50-99 employees) do; all the firms with between 100 and 999 employees have their own generators; and, finally, 66.7 percent of the largest firms (with over 1,000 employees) do. Only one firm in the east did not have a generator for production machinery, although it did for other purposes.

Table 8.1: Percentage of Firms with Private Generators

Employment size	Location			
	East	North	South	All
20-49	93.3	91.7	94.1	93.4
50-99	100.0	100.0	94.2	97.4
100-199	100.0	100.0	100.0	100.0
200-499	100.0	100.0	100.0	100.0
500-999	100.0	100.0	100.0	100.0
1000 and over	66.7 ^a	100.0	100.0	94.1
All	95.7	98.2	97.7	97.4

^a One of the four firms in this category did not have a generator for production but for other purposes.

Of all the business problems affecting firms in Nigeria, problems over the infrastructure are by far the biggest (as shown elsewhere). In fact, infrastructure problems are nearly two-and-a-half times worse than the next biggest problem (finance). And deficiencies in the supply of electricity are by far the biggest infrastructure problem faced by firms. Overall some 94 percent of firms reported this is the case as shown in Table 8.2.

**Table 8.2:
Percentage of Firms Which Reported Electricity as Their Biggest Infrastructure Problem**

Employment size	Location			
	East	North	South	All
20-49	100.0	91.7	90.1	93.3
50-99	88.9	100.0	94.1	94.9
100-199	90.0	91.2	92.9	92.0
200-499	87.5	91.0	100.0	96.0
500-999	100.0	100.0	100.0	100.0
1000 and over	66.7	80.0	100.0	88.2
All	91.5	92.9	95.3	93.9

Costs of Public and Private Electricity Provision

Manufacturers' Responses to Electricity Deficiencies

Kyu Sik Lee et al. (1999) report that there are “essentially four ways in which firms might respond to infrastructural deficiencies. These are: relocation; factor substitution; private provision; and, output reduction.” In our study, we found that there was a further response mechanism: product substitution. These response mechanisms are discussed below.

Relocation. There was no evidence of firms relocating to other areas to obtain improved electricity supply. As Table 8.1 indicates, there is little variation in the incidence of generators in the different regions, implying there is little reason to move from one area to another. However, there is evidence that firms do contemplate moving to overcome business environment problems. For example, *This Day*, 12 April 2001, reported that the multinational firm Siemens was considering relocating its factory from one state to another to avail of lower local government taxes. Some firms reported making payments to encourage NEPA to “relocate” their load-

shedding elsewhere. One, with huge refrigerated storage capacity, paid a regular sum to ensure it had a continuing supply. However, if there was an outage approaching two hours duration, the firm took additional measures to ensure the disruption was minimized.

In our more detailed interviews with a small sample of firms, we asked firms about the advantages and disadvantages of being located on an industrial estate in respect of the supply of electricity. On balance, there seem to be more problems being located on an industrial estate than otherwise. Some firms noted that if NEPA wanted to load shed, it could pull one lever and shed more power quickly than getting an equivalent shedding from non-industrial-estate areas. Other firms put a countervailing position noting that firms in an industrial estate “could put up more of a hue and cry.” Firms, whether on an industrial estate or elsewhere, also noted that their location near residential areas resulted in complaints and legal action as a result of noise pollution from the operation of private generators.

Factor substitution. There was much evidence of factor substitution (e.g., adjusting the mode of production in favor of less electricity-intensive inputs). Firms commonly reported that they were avoiding machines with electronic controls that were observed to be more susceptible to damage from power fluctuations and outages. (It should be noted that one of the most experienced electrical engineers in Nigeria opined that electronic machinery could be protected with simple rewiring, but that “there are no good electrical workshops in Nigeria.”) In the case of one pharmaceuticals firm, it was noted that repairs to the electronic monitoring equipment on its tablet-making machines was beyond the capability of the firm, and damage might lead to getting an engineer from Italy for up to two weeks per incidence of damage. Another pharmaceutical firm with multinational partners confirmed this by observing that it could take a week to repair such broken equipment through a series of “hand-holding” phone calls with the European suppliers; that it was not uncommon then to find that the resources were not available locally to undertake the repair; and that replacement parts were needed from Europe resulting in a machine being out of action for up to three weeks. When some machines are capable of processing 180,000 tables per hour, this is a sizeable loss. In some cases, older types of machines are no longer available, so firms are buying modern machines and then converting them from electronic to mechanical or electrical operation. In such cases, firms may have to modify their raw materials so that the downgraded machines can process the inputs.

At least one firm reported wanting to overcome the problems of getting servicing skills in Nigeria by operating machinery that was linked by satellite and continuously monitored in real time by the European suppliers. However, this was impractical because it required a continuous supply of electricity. (Another firm that had installed such technology to be internationally competitive and supply locally based multinationals with their packaging could not use it all the time because of telecommunications infrastructure problems.)

While the cost implications of electricity supply deficiencies will be dealt with further below, it is worth noting one example at this point in the context of factor substitution. A Nigerian firm making lighting fixtures and negotiating a joint-venture with a Malaysian firm reported that better electricity supply in Malaysian firms enabled them to use automated machinery that resulted in three times the output of a similar-sized factory in Nigeria.

The need to use suboptimal technology because of electricity supply problems is not limited to production technology. Most firms, other than the largest and the multinational firms, complained about maintenance problems on the information technology hardware they had or were installing. Part of the difficulty is that local consultants are unable to maintain equipment affected by electricity-supply deficiencies. For example, one firm reported embarking on a computerization program that was planned to take six months, but which has taken 12 months to date and is still ongoing, requiring the hire of a second consultancy to deal with the maintenance problems.

There is relief at hand for some firms in the form of natural gas. Several of the firms interviewed in the more-detailed survey reported that firm-specific studies have been undertaken by natural gas firms with the objective of making proposals to switch to gas. One of the largest textiles firms hoped to be the second firm in Nigeria to switch from electricity to natural gas and get a 30 percent reduction in energy costs. A substantial steel-pipes firm is making the change but notes it will have a need for at least one foreign gas-power technician to operate the system, which will not be easy because of procedures over the hire of expatriates.

Private provision. As noted earlier, nearly all Nigerian firms have made private provision for the generation and supply of electricity to substitute for the public provision. As noted by Kyu Sik Lee et al. 1999, “by providing their own infrastructural services, firms are substituting internal capital in the form of equipment and machinery, as well as labor in the form of maintenance personnel, for the publicly provided infrastructure services which are not forthcoming.” Not only this, firms have to pay operating costs for both public and private provision. NEPA’s electricity bills are made up of three charges: the consumption charge, a charge measured in the number of units of actual consumption (kilowatts per hour-KwH); the fixed charge, a standard (but insignificant) charge payable whether or not the service is used; and the demand charge, a charge based on the installed (power-using) capacity of the firm. The demand charge is levied on the firm no matter what the KwH consumption of the firm is. In some firms, the demand charge is constant, while in other firms it can be in inverse proportion to the amount of fuel consumed, as shown in Table 8.3.

In this table, a furniture firm in one month consumed 1,938 KwH and the demand charge was for 135 units; in another month, the consumption was 489 KwH and the demand charge was for 180 units. In the case of a plastic container firm, in one month the consumption was 33,550 units while the number of demand units was 150; and in another month, the consumption was 13,970 units, while the demand units were constant at 150 units. This table shows that the demand charge can vary from 5 to 461 percent of the consumption charge and that the firm is paying a charge to the public provider whether it uses the service a little or a lot. The table also shows that the cost of electricity from the public provider can vary from N5.78 to N93.06 per KwH according to the units of consumption relative to the installed capacity of the firm.

Table 8.3: Demand Charge as a Percentage of Consumption Charge

	Firm type					
	Furniture		Tires	Plastic containers		
Date of bill (mm/yy)	02/01	07/00	02/01	02/01	11/00	09/00
Consumption: units(KwH)	1,938	489	185	33,550	17,180	13,970
Consumption: cost (N.)	9,186	2,317	877	159,027	81,433	66,219
Demand charge: units	135	180	70	150	150	150
Demand charge: cost (N.)	31,050	41,400	16,100	34,500	34,500	34,500
Fixed charge	240	240	240	240	240	240
Total cost per KwH of consumption	20.76	89.40	93.06	5.78	6.76	7.23
Demand charge as percentage of consumption.	30	6	5	461	236	192

It is not uncommon for firms to operate their generators even when the public supply is available. Take one case in which a small foam mattress firm observed that it would have to abort the whole production batch if there was a power failure during production. This would cost N30,000 in materials, and it would take one hour to clean the equipment before reuse. One of the largest plastics packaging firms reported that NEPA operates only for 1-2 hours per day, and as the firm operates a continuous manufacturing process, it cannot switch from one source to the other because the switch-over process would cause it to lose 3-4 tons of raw material—about half the material being processed at the time.

It is becoming more difficult for firms to provide their own power as a substitute to public deficiencies because importers of generators now have to get permission from NEPA to import them. In the 2001 budget, it was reported that the government:

as part of measures to forestall sabotage of NEPA’s operations has directed ... that ... importation of all types of generating sets must be approved by NEPA... One of the factors which prompted the introduction were allegations of deliberate frustrations of NEPA’s ability to improve power supply. Importers of generating sets are said to be conniving with some NEPA officials to stall the authority’s efforts and boost their business. The [government] was said to be particularly worried because of the threat this group of importers pose to the country’s dream of pushing up electricity generation. (Business Times 2001)

The Minister of State for Power and Steel, on the other hand, was reported as saying that “NEPA was merely interested in knowing the importers ‘in case of trouble’” (Guardian 2001). One of the firms interviewed noted that “permission is hard to get” to import generators and it had established a factory to import components and manufacture generators in Nigeria.

Output reduction. Firms commonly reported output reductions due to deficiencies in the public provision of electricity, not uncommonly a loss of up to 30 percent. One of the largest sufferers, a leading manufacturer of steel sheet, reported that its BRC machine is constrained by the lack of power and the wear and tear on the 20-year-old machine by the constant power interruptions—even though the firm makes informal payments to NEPA to load-shed in its favor. The machine has the capacity to make 480 sheets per day of black EM10—the firm’s most popular product—

and the firm reports a demand for the machine's entire potential output. However, because of the outages, the 20-minute startup time when the power is reestablished, and the repairs which have to be made to the machine, it takes five days to make 480 sheets, resulting in a potential loss to the firm of 80 percent of output—leading to a potential revenue loss of N173m per year as shown in Table 3.2. (In addition, there is damage to the machine of some N1m. per year.)

Table 8.4: Potential Sales Loss of EM10 Sheets Due to Electricity Deficiencies

	Sheets per day	Sheets per year	Sale price of sheet	Sales per year (N.)
Machine capacity	480	120,000	1,800	216,000,000
Actual output	96	24,000	1,800	43,200,000
Potential loss	384	96,000		172,800,000

Source: Firm interview.

A leading foreign-managed manufacturer of cartons, supplying most of the multinationals in the food sector noted that it loses 25 percent of production due to deficient power supply. Several of its machines are electronically controlled and when they stop, the whole batch of products has to be scrapped. It also estimates that it loses 10 percent of its materials' inventory because of such stoppages.

One of the most dynamic firms interviewed—which operates three shifts per day, seven days per week, month after month, except for a two-week closedown at Christmas—uses privately and publicly provided power. It had converted its machines from electronic operation to mechanical operation to make them less susceptible to damage yet still estimated its production loss at 10 percent—mostly due to equipment damage caused by power-supply problems.

Product substitution. A couple of pharmaceuticals firms, within the more detailed survey, noted that the mix of products they produced was influenced at least in part by the power deficiencies. One, for example, traditionally produced a range of 26 products, but because of the limited shelf-life of items such as vitamins it has concentrated on a range of five products that are faster moving and in which the demands of refrigerated storage down the supply-chain are less critical.

Capital Costs and Their Incidence

Firms are spending a considerable amount of capital on the private provision of electricity. As shown in Table 8.5, on average some 22 percent of the total value of equipment and machinery is represented by generators and accessories, such as cabling. This figure varies from region to region, with the north having the lowest percentage (at 17 percent), the east the highest percentage (at 30 percent), with the south in the middle (at 21 percent). There is no general bias by firm size within the regions, except that the highest percentages are the preserve of the largest firms.

**Table 8.5:
Value of Generators and Accessories
as a Percentage of Total Value of Equipment and Machinery**

Employment size	Location			
	East	North	South	All
20-49	16.6	21.7	23.3	20.9
50-99	55.3	12.7	17.9	27.2
100-199	31.8	14.0	16.1	18.9
200-499	7.0	8.9	18.8	14.9
500-999	61.2	21.1	19.6	29.2
1000 and over	11.2	35.8	44.1	37.5
All	30.3	16.7	20.6	21.9

The overall average of some 22 percent is more than double the finding observed in the 1988 World Bank Infrastructure Project Establishment Survey, at which time the overall average was 9.96 percent, with the small firms having an average of 22.1 percent, and the larger ones an average of 9.65 percent.

Firms have an ongoing capital cost in the maintenance of their equipment and machinery. Damage in one firm caused by electricity deficiencies resulted in spending on new machines and parts of some N75m. per year. As shown in Table 8.6, on average damage to equipment and machinery accounts for 3.3 percent of total value of equipment and machinery. Regional variations are consistent with the findings in Table 8.5—in the east, the damage per year is the highest and equal to 6.9 percent of the total value, while in the north it is the lowest (0.8 percent), and in the south in the middle at 2.7 percent.

**Table 8.6:
Damage to Equipment
as a Percentage of Total Value of Equipment and Machinery**

Employment size	Location			
	East	North	South	All
20-49	0.9	0.1	1.5	1.0
50-99	15.9	0.9	1.6	6.1
100-199	3.5	1.0	1.1	1.5
200-499	1.1	0.8	5.4	3.6
500-999	24.8	4.3	0.2	10.9
1000 and over	0.6	0.2	3.4	1.2
All	6.9	0.8	2.7	3.3

Clearly firms want to provide sufficient standby capacity to run their entire plant during outages. However, most cannot because of the capital cost (which as noted above represents some 22 percent of the total value of equipment and machinery) and firms frequently only operate key production processes during outages. It is unusual as noted in Table 8.1 where one of the four firms in the east with over 1,000 employees only used its generator for non-production purposes during outages.

The impact of these capital costs can be considerable on firms, threatening their whole development. In the case of a new auto-parts manufacturer, reported to be the first of its kind in Nigeria, a substantial amount of planning was undertaken by Indian engineers who are used to designing similar turnkey operations in other countries. The new firm is operating on a trial basis, with all the resources including equipment and machinery in place for the roll-out in phases of increased capacity. The capital equipment for each of the phases is supported by an appropriate on-site stock of spare parts as recommended by the Indian project engineers. Problems due to electricity deficiencies started immediately—the first time the equipment in the laboratory was turned on the rheometer broke. Soon all the spare parts earmarked for the production line in the trial phase were used up, the spare parts for second phase were consumed, and parts then had to be “stolen” from the second-phase machinery. In the first three months, an unexpected US\$25,000 of spare parts had been consumed, and the lead time in getting additional parts has threatened the planned roll-out. The firm reports “we are having to move to a totally different frame of mind—we are now going onto an undreamt of inventory mentality.”

An Indian-managed manufacturer of plastic pipes observed that once a year the phasing of the electricity would go into reverse and damage all the motors in the factory, bringing the complete business to a standstill until they could be replaced or repaired.

Not only do firms need back-up stocks in spares, but they also need back-up generators. It is not uncommon for the capital cost of generators to be duplicated so firms can switch from one to another when there are breakdowns. In several cases, firms operate one generator for a period of time, and then switch to another in order to allow each to rest. In some cases, there is a tripling of capital costs as firms may have three surge protectors per machine to cope with operating conditions beyond what the protectors were designed for.

The Private Cost as a Measure of Willingness to Pay for Reliable Services

The capacity utilization of firms’ generators in Nigeria is high, as measured by the proportion of time they are being operated over the period of time the firm is operating. Table 8.7 indicates that on average all firms are privately providing electricity for some 67 percent of the time. There is an insignificant variation between the east and south regions (at around 70 percent) while in the north region they are used for 56 percent of the time. In general, there is little variation by size of firm: firms over 1,000 employees use them the least (at 63 percent of the time), while firms with 100-199 employees use them the most (at 69.5 percent of the time).

Table 8.7: Percentage of Total Demand for Electricity in Firms Which is Privately Provided

Employment size	Location			
	East	North	South	All
20-49	68.9	49.0	68.9	65.5
50-99	77.8	54.3	71.2	67.2
100-199	67.6	66.7	71.2	69.5
200-499	74.5	58.6	68.6	67.3
500-999	77.5	38.3	69.3	64.2
1000 and over	53.3	53.2	72.5	62.9
All	70.7	55.9	70.0	66.8

There is a substantial difference between the cost of publicly and privately provided electricity as documented in Table 8.8. On average, the cost of privately provided electricity is 2.42 times more than that provided by NEPA—N19.05 per Kwh compared with N7.86 per Kwh. This figure approximates to the view of the electrical engineer mentioned earlier who reports that privately provided power is some 2.5 times more expensive than publicly provided power. He opined that in a typical textiles factory in Nigeria, the cost of publicly provided electricity represents about 2 percent of sales, while privately provided electricity represents 5 to 8 percent of sales.

The table also shows the variation between the extremes in both the case of privately and publicly provided electricity even though outliers have been removed. It was noted earlier that the variation between the cost per Kwh of publicly provided electricity is due to the demand charge, which can vary from 5 to 461 percent of the consumption charge. (The standard consumption charge is N.4.74 or USD 0.04 per Kwh.) In Table 8.8, the highest cost of electricity per Kwh is 3.89 times the lowest cost, while the highest cost of privately provided electricity is 4.4 times the lowest cost.

Table 8.8: Cost of Publicly Compared to Privately Provided Electricity (N. per Kwh)

	Publicly provided	Privately provided
Lowest (N. per Kwh)	5.36	9.00
Highest (N. per Kwh)	20.76	39.60
Mean (N. per Kwh)	7.86	19.05
Mean (USD. per Kwh)	0.07	0.16

Variation in the cost of privately provided electricity depends mostly on the variation in the cost of fuel and the efficiency of the generators, which is heavily dependent on the age of the generator and the quality of the servicing and operation. The costs of privately provided electricity, shown in Table 8.9, are made up of the fuel cost, staff to run the generator(s), servicing costs (including maintenance personnel, oil changes, and running repairs), and depreciation. Fuel, at an average of 75 percent of total cost is six times higher than the next highest cost, namely, servicing.

The average price paid for diesel fuel among the firms interviewed in more detail was N31.29, ranging from a low of N25.00 and a high of N40.00 per liter. This compares with an official price for diesel of N21 per liter, while the highest price reported was N50. Few firms can get

diesel at the official price. One of the biggest multinationals in Nigeria obtains fuel as the official price in Lagos, while at its plant in Aba, even with its purchasing power, it was paying N40 at the time of the interview and hoped the price would fall back to N30-32. This price variation resulted in the cost of private generation in Aba being N13.5 per kWh, while in Lagos it was N9.00.

Table 8.9: Cost of Fuel, Staff, Servicing, and Depreciation as a Percentage of Total Cost

Cost item	% of total cost
Fuel	75
Staff	4
Servicing	12
Depreciation	10

Note: May not add to 100 percent due to rounding.

A cost that firms were unable to quantify was the cost of searching for fuel. Most firms reported on the difficulties. One firm, which needed two 200 liter drums per day and was willing to pay the high price of N40 per liter, spent from 5-48 hours getting fuel to run the generator for a day. In addition to the search costs for the fuel, some firms reported that suppliers of fuel would not supply on account, they spent long periods obtaining cash for the fuel, and these costs were compounded by providing security for the cash collector and the fear that both collector and security guard would abscond with the money.

In many cases, generators are aged and are being operated at beyond the endurance levels envisaged in their design leading to above-normal maintenance costs. Sometimes the fuel is adulterated, and many firms reported having to purchase small quantities of fuel and testing it before buying it for use in production.

Production Cost Increases

The erratic public supply and the cost of private supply are adding considerably to the overall cost of production in firms as touched upon already. One of the largest paint firms stated that the bad infrastructure, of which electricity is the biggest component, “doubles the cost of production.” In the case of pipe manufacturers, poor supply of electricity pushes up production costs by 33 and 7 percent, respectively, in the case of steel pipes and plastics pipes manufacture. Pharmaceutical firms believed that the poor power supply increased production costs by 20 percent. In a specific instance, charted in Table 8.10, a firm observed that it had stopped production of Paracetamol tablets when the cost of production at N45 was N7 higher in Nigeria than in India. The firm estimated that if it enjoyed the same standard of infrastructure, particularly electricity, as enjoyed in India, its production costs would be N2 lower than in India.

Table 8.10: Cost of Production in Nigeria Compared with India for Paracetamol

Item	Nigerian production cost		Indian production cost
	Actual	Estimated cost with Indian infrastructure	
Box of 96 paracetamol tablets (Naira)	45	36	38

Conclusions

While most of the imported competition firms that report facing comes from suppliers in South and Southeast Asia, they are most worried about competition from Ghana within the region, particularly within the context of Economic Community of West African States (ECOWAS). It is interesting to compare the views on the electricity supply of Nigerian firms with those of Ghana, which were obtained by the World Bank in late 2000, on the supply of electricity and on the utility provider.³¹ In Ghana, a multinational firm reported that its electricity cost was USD0.07 per KwH, a figure which is identical to the average figure reported in Table 8.8. However, whereas in Nigeria firms relied on average on self-generated power for 67 percent of the time, in Ghana firms could report using self-generated power for up to 10 percent of the time. Furthermore, there are striking differences in the attitude of the power generators and the firms to one another. In Nigeria, one firm reported that it rarely received NEPA bills, but regularly received disconnection notices. The only way it could get a disconnection threat withdrawn was to take an old bill to NEPA, pay it for the second time, and get it receipted for the second time. It noted it had never been able to query a bill, it was told to pay first, and when the bill was paid, NEPA still refused to answer the query. In another case, a firm was so worried about not receiving a bill and being disconnected without notice that it was in credit to NEPA by the equivalent on one year’s supply of electricity. In Ghana some firms do report problems with the electricity supply, noting that up to 10 percent of power is privately provided and that it adds some 5 percent to the production costs. However, the attitude of the provider seems to be different with firms reporting that “if one complains about water or electricity, the authorities do something about it” and that the authority informs it of potential outages.

Firms would prefer to pay twice the price for a stable supply.

³¹ Observations were obtained in the preparation of the World Bank publication titled *GHANA: International Competitiveness—Opportunities and Challenges Facing Non-Traditional Exports* (World Bank 2001c).

9. The Implications of HIV/AIDS for Nigerian Manufacturing Firms

Center for International Health, Boston University (Primary Author: Sydney Rosen)

Introduction

When the results of the 1999 HIV sentinel seroprevalence survey for the Federal Republic of Nigeria were released in November 1999, they showed a nationwide median HIV prevalence among women attending public antenatal clinics of 5.4 percent. This widely cited median prevalence estimate was a worrisome, though not catastrophic, increase from the prevalence of 4.5 percent measured by the last sentinel survey in 1995. It also masked tremendous geographical variation among the sentinel sites in the country, from a low of 0.5 percent to a high of 21 percent (National AIDS/STD Control Programme 1999).

Whether the trend of gradual increase will persist in Nigeria, will be replaced by a much steeper rise as the epidemic takes off, or will level off at 5-6 percent prevalence is unclear. National prevalence in some of Nigeria's neighboring countries, such as Niger, Chad, and Benin, has remained well under 5 percent. Cameroon, which borders Nigeria to the southeast, however, had a rate of almost 8 percent in 1999, and in one country in the region, Cote d'Ivoire, prevalence has hit the double-digit levels more typical of eastern and southern Africa (UNAIDS 2000).

In recognition of the potential for Nigeria to follow the path of Cote d'Ivoire and other parts of the continent and of findings from other African countries indicating that HIV/AIDS is having a serious impact on business development and economic growth, the World Bank Africa Region's RPED asked the Center for International Health (CIH) of the Boston University School of Public Health to develop an AIDS component for the RPED survey of manufacturing firms in Nigeria. The survey was carried out in March-April 2001. It included approximately 230 manufacturing firms located in all the major industrial areas of the country and ranging in size from just a handful of employees to several thousand. This report contains the results of the AIDS component of the survey and their implications for Nigerian businesses, the Nigerian government, bilateral donors, and the World Bank.

The AIDS module of the survey was designed to answer three main research questions:

- What is the risk of HIV/AIDS in the workforces of Nigerian manufacturing companies?
- What are the types and magnitudes of costs that HIV/AIDS imposes on the companies?
- What actions are companies taking to manage the impact of HIV/AIDS among employees and what has led some firms to act while others have not?

The answers to these questions should provide some guidance to businesses, governments, and the World Bank as they develop strategies for responding to the epidemic in Nigeria.

This chapter is structured as follows. In the next section, we summarize what is known about the HIV/AIDS epidemic in Nigeria, briefly review the literature on the impact of HIV/AIDS on businesses in Africa, and describe the data set. In the third section, we use the little information that is available to comment on the risk of HIV in Nigerian workforces. The fourth section analyzes the survey data on the current and potential costs to Nigerian firms from HIV/AIDS,

including direct costs, such as retirement benefits and medical care, and indirect costs, such as absenteeism. The fifth section then takes up the companies' responses to HIV/AIDS and attempts to account for the variation in responses on the basis of firm characteristics. This chapter concludes in its final section with a summary of the main results, some tentative conclusions, and recommendations for further action.

Background

HIV/AIDS in Nigeria

To understand the current and potential risks to Nigerian businesses from HIV/AIDS, we need to know the prevalence of HIV infection in the workforce. In some countries that have been harder-hit by the epidemic, such as South Africa, a number of companies have carried out voluntary, anonymous, unlinked seroprevalence surveys to determine the magnitude of the problem in their workforces. The results of these surveys have gradually found their way into the public domain, such that the magnitude of the problem among men employed in the formal sector is at least partly documented. This is not the case in Nigeria. Neither the government nor the research community has access to data on HIV prevalence among Nigerian men who are not in known high-risk categories, such as patients with sexually transmitted diseases (STDs) and soldiers.

Like most African countries, the Nigerian government monitors the HIV epidemic through surveys of pregnant women who attend selected public antenatal clinics. The most recent survey, in 1999, obtained the prevalence figures cited in the introduction to this report: a median national adult prevalence of 5.4 percent, with mean rates among the states ranging from 1.7 percent to 16.8 percent. The variation at the individual clinics was even greater, with sites ranging from 0.5 to 21 percent. Mean and median rates by region and mean rates by state are shown in Table 9.1.³²

The rates shown in Table 9.1 are drawn from two public health clinics per state, one in the state capital and one not in the state capital. The survey aimed for a sample size of 300 per site and tested at least 500 in both clinics in all sites except Ebonyi, Enugu, and Sokoto. The sites were chosen to ensure equal representation for all states in Nigeria, not on the basis of a population probability-based sampling scheme. The survey thus over-sampled states with smaller populations. The 6.6 percent prevalence for Lagos State, with an estimated 15–49-year-old population of about 30.5 million, for example, indicates about twenty times more HIV infections than does the 6.7 percent prevalence for Niger State, with an estimated 15–49-year-old population of 1.4 million. Although the report of the survey uses the “not in the state capital” sites to represent rural areas, it appears that most were in secondary cities.³³ While this makes it impossible to disaggregate the results into urban and rural rates, it may improve our understanding of the risk facing Nigerian manufacturing firms, most of which draw their workforces from urban areas.

³² Median values are preferred for national and regional estimates because mean values are sensitive to outliers from individual states, sentinel sites were not selected using probability-based sampling schemes, and population HIV risk factors cannot be assumed to be consistent across all sentinel sites due to cultural and behavioral differences in sexual practices.

³³ Sentinel sites were selected in part on their ability to draw an adequate number of pregnant women during the two-month survey period. This criterion probably made urban and periurban clinics more likely to be selected than rural clinics.

Table 9.1: Mean HIV Prevalence Among Pregnant Women in Nigeria in 1999
(Regional medians in brackets)

State	Sample	Prevalence	State	Sample	Prevalence	State	Sample	Prevalence
<i>Southeast—6% (5.2%)</i>			<i>Southwest—3.5% (3.5%)</i>			<i>South—6.0% (5.2%)</i>		
Abia	507	3.0%	Ekiti	584	2.2%	Akwa Ibom	600	12.5%
Anambra	598	6.0%	Lagos	527	6.6%	Bayelsa	529	4.3%
Ebonyi	313	9.3%	Ogun	598	2.5%	Cross River	600	5.8%
Enugu	464	4.7%	Ondo	594	2.9%	Delta	599	4.2%
Imo	564	7.8%	Osun	600	3.7%	Edo	544	5.9%
			Oyo	600	3.5%	Rivers	590	2.9%
<i>Northeast—4.1% (4.5%)</i>			<i>Northwest—4.2% (3.2%)</i>			<i>North central—8.0% (7%)</i>		
Adamawa	600	5.0%	Jigawa	600	1.7%	Benue	600	16.8%
Bauchi	599	3.0%	Kaduna	597	11.6%	FCT	600	7.2%
Borno	600	4.5%	Kano	600	4.3%	Kogi	600	5.2%
Gombe	599	4.7%	Katsina	598	2.3%	Kwara	590	3.2%
Taraba	600	5.5%	Kebbi	600	3.7%	Nasarawa	540	10.9%
Yobe	537	1.9%	Sokoto	300	2.7%	Niger	600	6.7%
			Zamfara	597	2.7%	Plateau	620	6.1%

Source: National AIDS/STD Control Programme (1999)

It is likely that the rates shown in Table 9.1 understate the true prevalence of HIV among Nigerian adults, for two main reasons. First, HIV infection suppresses fertility, biasing the population of women who attend antenatal clinics toward those who are not infected. This is an inherent problem for all countries that rely on antenatal data to estimate population prevalence. The magnitude of the bias is disputed, but recent studies in Uganda and Tanzania have concluded that population rates among women exceed antenatal rates by 22-28 percent (Fabiani et al. 2001) and 35-65 percent (Zaba et al. 2000).³⁴

Second, and more difficult to deal with, are the socioeconomic and geographic biases that may affect the Nigerian data. Anecdotal evidence suggests that the Nigerian women who utilize public antenatal clinics are higher on the socioeconomic ladder and more likely to be from urban areas than the population as a whole, because a large proportion of poor women, especially in rural areas, give birth at home without ever visiting a health facility (personal communication, L. Taylor, DFID/Nigeria, and P. Okwulehie, Ministry of Labor, 2001). At the same time, wealthy and middle class Nigerian women often utilize private antenatal clinics (National AIDS/STD Control Programme 1999). In the early stages of the AIDS epidemic in central Africa, HIV prevalence was found to be higher among the upper socioeconomic groups in a population. As the epidemic has matured and overall prevalence increased, however, this pattern has reversed itself. Since we do not know the magnitude or even the direction of these biases, the antenatal clinic (ANC) data should be treated with caution as an estimate of true prevalence in Nigeria.

³⁴ The latter estimate applies to populations in which contraceptive use is low (<15 percent). The most recent Demographic and Health Survey for Nigeria, in 1990, found current contraceptive use at approximately 7.5 percent (Federal Office of Statistics 1992).

Without several years of reliable data, it is difficult to predict the path the HIV/AIDS epidemic will take in Nigeria. Whether the historical trend of very gradual increase will persist, will be replaced by a much steeper rise as the epidemic takes off, or will level off at 5-6 percent prevalence is unclear. As noted earlier, median national prevalence in some of Nigeria's neighboring countries, such as Niger, Chad, and Benin, has remained well under 5 percent. Cameroon, which borders Nigeria to the southeast, however, had a rate of almost 8 percent in 1999, and Cote d'Ivoire's rate now exceeds 10 percent (UNAIDS 2000). We will know much more about Nigeria's fate when the results of the 2001 ANC survey are released sometime in 2002.³⁵

The Impact of HIV/AIDS on the Private Sector in Africa

To our knowledge, no research has been done on the impact of HIV/AIDS on Nigerian businesses during the past half-decade.³⁶ There is, however, a small body of published research on the impact of the HIV/AIDS epidemic on businesses in other parts of Sub-Saharan Africa. In addition, the CIH team has completed several detailed studies of the costs of HIV/AIDS to southern African companies. This work provides both a framework for understanding the possible effects of the epidemic on Nigerian firms and some benchmark cost estimates that can be used to help fill in gaps in the survey data set.

Conceptual framework. Although a number of different approaches have been taken to assessing the impact of HIV/AIDS on firms, most end up estimating a fairly similar set of specific costs. Building on previous work by the AIDSCAP Project and others, the CIH has developed a model that reflects two of the most important characteristics of HIV/AIDS from a firm's perspective: its very high prevalence in many companies' workforces; and the long latent period between infection with HIV and death from AIDS. The model is illustrated in Figures 1 and 2 below.

Table 9.1 identifies and describes the range of impacts of HIV/AIDS in the workforce. In the top row are costs that are associated with an individual case of HIV/AIDS, independent of the total number of cases. The direct costs of this type, which stem mainly from greater use of medical, disability, and death benefits, are fairly straightforward to assess. The indirect costs associated with a single infection are more difficult to quantify but can be estimated if detailed data on absenteeism are available.

³⁵ We are aware of two efforts to model future HIV prevalence in Nigeria. The National AIDS/STD Control Programme of Nigeria's Federal Ministry of Health used the WHO's EPIMODEL to project that HIV prevalence will increase by almost 90 percent between 1999 and 2003 (i.e., from about 5.4 percent to perhaps 10 percent). In an unpublished report, the POLICY Project projected a much smaller increase, about 25 percent between 1999 and 2005 (National AIDS/STD Control Programme 1999; POLICY Project 2001).

³⁶ Some firms may have undertaken their own studies or hired consultants to do it, but they have not publicized the results.

Figure 9.1: Costs to Companies of HIV/AIDS in the Workforce

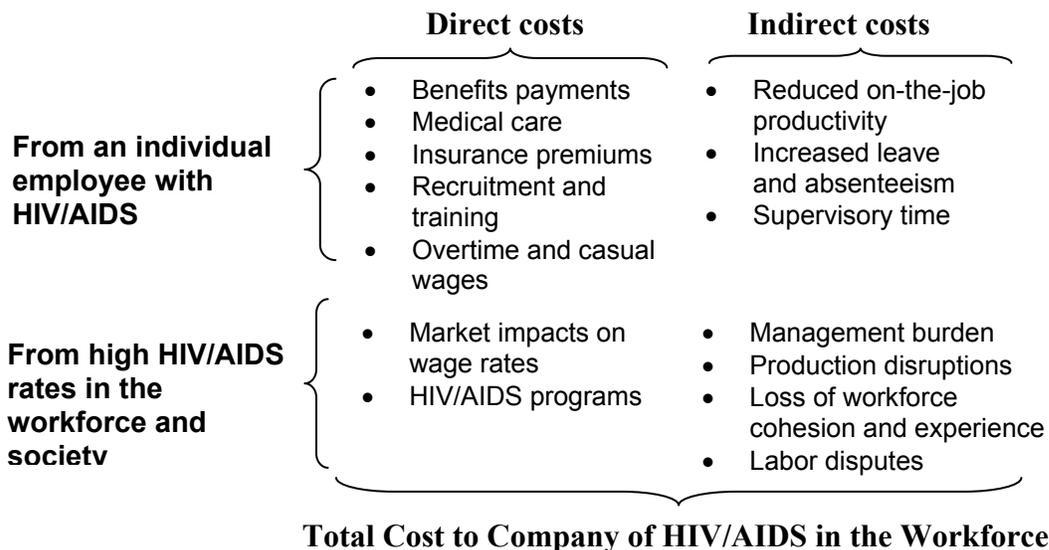
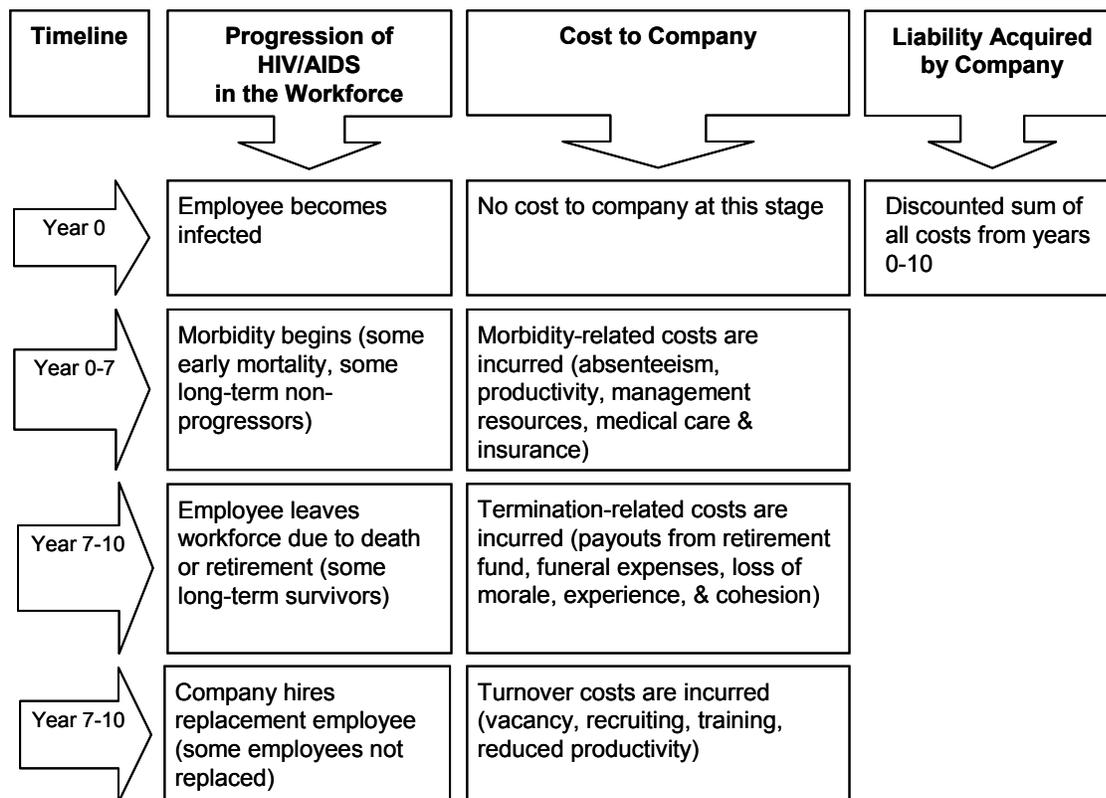


Figure 9.2: Timing of Cases and Costs of HIV/AIDS in the Workforce



The costs in the bottom row of Table 9.1 arise from the high rates of HIV/AIDS in the workforce and in the society as a whole. Those that are direct stem mainly from changes in market prices for labor, medical care, and insured benefits. The effect of HIV/AIDS on these costs can be modeled for a sector or country as a whole, but it is hard to quantify for any one firm. Finally, the most difficult set of costs to quantify is the indirect or productivity impacts of having a large number of employees become ill and die. These costs, which cannot be measured with currently available data, are potentially extremely important for organizations to recognize and manage.

Figure 9.2 depicts the same set of costs as Figure 9.1 but places them on a timeline reflecting the natural history of the disease. The time gap between infection with HIV and death from an AIDS-related condition has been estimated at a median of 7-10 years in the few studies that have followed long-term cohorts in developing countries (Deschamps et al. 2000; Malamba et al. 1999). The period of symptomatic illness is usually fairly brief—1–2 years on average. The costs associated with HIV/AIDS therefore generally do not begin until 5–8 years postinfection. At the time an individual employee is infected (year 0), therefore, and assuming he or she remains in the workforce, the employer becomes responsible for a stream of future costs that will be incurred six, seven, or more years in the future. If the employee leaves the company's workforce in the interim, the firm will escape some of those costs, and high turnover rates might thus blunt the impact of the epidemic. If HIV prevalence is high in the entire labor force in the country, however, then replacement workers will be drawn from a similar risk pool (in other words, the new employee might be just as likely to be HIV-positive as the old one).³⁷

Throughout this report we will use the framework illustrated in Figure 9.1 to categorize and aggregate the costs of workforce HIV/AIDS to Nigerian firms. In the rest of this section we review both published estimates of the direct and indirect costs of HIV/AIDS to African businesses and the results of the CIH's own work in southern Africa, with the goal of providing context to the Nigeria survey results discussed in the following sections.

Published estimates. The most widely cited of the published assessments are six case studies in Kenya and Botswana conducted by the AIDSCAP project in 1994. They report costs ranging from a low of less than 1 percent of profits to a high of nearly 9 percent, with most costs resulting from employee absenteeism (AIDSCAP 1995).³⁸ A more recent analysis of a sugar mill in South Africa estimated a cost of approximately \$1,600 per infected employee per year during the last two years of the employee's life, including two extra months of absenteeism over this period (Morris and Cheevers 2000). In contrast, Smith and Whiteside (1995) found that costs were low for three companies in Zambia, although there was a marked increase in absenteeism and mortality. A detailed study of a large tea estate in Malawi in 1996 (Jones 1996) came to similar conclusions, observing that the company was able to cap costs in the short run by adjusting its employees' contracts and benefits. A survey of a set of agricultural estates in Kenya in 1997 concluded that HIV/AIDS accounted for an additional 1.6 days of sick leave per capita annually across the entire workforce (Rugalema, 1999). A five-company study in Botswana

³⁷ While employers might be able to screen out candidates who appear physically unfit and thus reduce the risk of late-stage HIV infection among new hires, permanent employees who know themselves to be HIV-positive are likely to avoid resigning voluntarily, which would make them ineligible for medical, disability, and death benefits.

³⁸ In this report, "absenteeism" encompasses both authorized leave (sick leave, annual leave, etc.) and unauthorized absences.

found that HIV costs were still relatively low as late as 1997: an average of 0.7 percent of the total wage bill (Greener 1997).

In the studies mentioned above, the share of costs attributable to absenteeism, medical care, pensions, training, and so on varied widely, as did the impact on the companies' profitability. The inconsistent methodologies and scarcity of hard data make their conclusions difficult to interpret. None of the studies attempted to quantify some of the less visible impacts of HIV/AIDS, such as the decline in sick workers' on-the-job productivity, the loss of workforce experience, and the blow to workforce morale of high morbidity and mortality among co-workers.

Results from the CIH's research in southern Africa. The CIH has recently completed detailed studies of the costs of HIV/AIDS to three companies in South Africa and Botswana. Although business and market conditions in Nigeria are very different from those in southern Africa, the CIH studies provide the most comprehensive and accessible estimates that have been made so far. In this section we summarize the findings of the CIH work, with a focus on results that could be of use in filling gaps in the Nigeria survey data set and determining its implications.

The key characteristics of the three firms and estimates of the costs of HIV/AIDS to these firms are presented in Table 9.2

Table 9.2: Cost of HIV/AIDS to Firms in the CIH study

Company	A	B	C
Location	South Africa (national)	South Africa (KwaZulu Natal)	Botswana
Sector	Heavy industry	Agriculture	Mineral processing
Workforce size	>20,000	5,000-10,000	<1,000
Company's discount rate (real)	6%	10%	4.50%
HIV prevalence	8.8% (1999)	22.9% (1999)	28.8% (2000)
Present value per infection as a multiple of average salary—technicians ^(a)	5.4	1.3	5.1
Share of indirect costs (productivity) in total cost	24%	93%	26%
Share of retirement and disability benefits in total cost	65%	0%	65%
Aggregate present value of infections acquired in 1999 or 2000 as a percentage of annual salaries	6.20%	3.40%	10.70%

(a) Technicians are skilled machine operators, drivers, craftsmen, engineering assistants, etc. They typically have both formal and informal technical training but no university-level education. The costs for this job level are provided as an example.

The results in Table 9.2 are the present values to the firm of new HIV infections acquired in the base year of the study (1999 or 2000). Costs that are incurred in the future, as depicted in Figure

9.2, are discounted using each company's own real discount rate. Table 9.2 thus shows the liability that the firm acquired in the base year as a result of new infections among employees that year.

Table 9.2 illustrates the large variation among firms in the costs of HIV/AIDS, depending on each company's production structure and human resource policies. For companies A and C, the out-of-pocket costs of retirement and disability benefits far outweigh the loss of productivity associated with absenteeism and illness on the job. This does not mean that the indirect costs for companies A and C are trivial—in fact, the indirect costs of a new infection for Company C are still greater, in absolute terms, than the total cost of a new infection for Company B. What it does underscore is the extent to which Company B has succeeded in capping its spending on workers' benefits. For all companies, the costs of benefits, while potentially very large, are relatively easy to predict and manage. The productivity loss associated with absenteeism and diminished performance on the job is much harder to quantify and manage, as are its spillover consequences for overall workforce morale and cohesion.

The Data Set

The survey carried out by RPED in Nigeria in March-April 2001 included 232 manufacturing firms in 13 states. The survey instrument, which focused largely on basic operational and competitiveness issues, included a set of questions designed to assess the exposure of the firms to HIV/AIDS risks and costs and the responses of the firms to these risks and costs. Most of these questions were intended to be asked of a firm's human resources or personnel manager. When no such person existed, the questions were generally asked of the general or operating manager. A separate, brief questionnaire was also created for company medical staff, for use in firms that maintained a clinic on-site. A member of the CIH team participated in interviews at approximately 10 companies in Lagos and Kano and obtained more detailed information about issues related to HIV/AIDS. We will use this extra information to supplement the full data set as needed.

In addition, a subsample of approximately 10 employees per company were interviewed individually and asked a set of simple questions about education, training, salary, etc. The employees were typically a convenience sample, chosen by the company to represent different job levels and divisions. The full subsample data set contains interview results for 1,776 employees.³⁹ Because few of the firms kept computerized records of their employees, we could not obtain average values for some of the parameters that are important to understanding HIV/AIDS risks and costs (e.g. the average salary of employees at a particular job level). Instead, we pooled the individual data from the subsample of workers interviewed individually and used the mean values from the pooled data set to create a set of "hypothetical workers" who have the average age, years of experience, and salaries of the entire subsample. The disadvantage of this approach is that it masks variation among firms in salary levels and workforce characteristics—all the employees at all the companies are assumed to look like the hypothetical workers.⁴⁰ In the absence of better data, this is the best course open to us.

³⁹ Throughout this report, we will refer to this smaller group of employees who were interviewed individually as "the subsample."

⁴⁰ Salaries were similar across all sectors, with exceptions for some job bands in some sectors, such as beverages.

The AIDS-related questions in the survey were designed to elicit three types of information, corresponding to the three research questions stated at the beginning of this report:

- (a) HIV/AIDS prevalence. To understand the costs companies might incur from HIV/AIDS among employees, we must know something about the prevalence of infection in the workforce. In the absence of seroprevalence data for formally employed men, we can only estimate prevalence by examining the composition of the workforce and the risk factors for HIV for different types of workers. The survey provided information on several known HIV risk factors (age, sex, geographic location, job level). It did not generate information on others (marital status, housing arrangements, incidence of other STDs). From the survey, we can draw limited conclusions about the risk of HIV/AIDS in Nigerian workforces.
- (b) Cost per HIV infection or AIDS case. We asked a series of questions about employee benefits, training costs, and absenteeism to try to determine the types and magnitudes of the costs companies will face as larger number of HIV-positive employees become ill and die. We obtained good data on the types of benefits provided and some indication of their size. Data on absenteeism and training costs were harder to elicit. In the analysis that follows, we will supplement the survey results with information from other sources.
- (c) Company responses to HIV/AIDS. Finally, and perhaps most importantly, we asked several questions to discern the companies' managers' knowledge of HIV/AIDS and determine if the companies have taken any actions to reduce or manage their exposure to HIV/AIDS costs. The answers to these questions, which depend only on the respondents' recent recollections, provide a clear picture of current views of the AIDS threat among managers of Nigerian manufacturing businesses and allow us explain their responses on the basis of some company characteristics.

The data set has limitations for the type of analysis that we wished to conduct. Because the survey generated a cross-sectional data set, we could not determine whether a firm's response to the epidemic is related to the true risk of disease in its workforce or is instead a reflection of the managers' level of exposure to information about the disease. The questionnaire was administered to an individual managerial-level employee who was asked to provide his or her "best guess" about the impact of the HIV epidemic on the labor force and the response of the company. The validity and reliability of these responses are unknown. Overall data quality, in terms of internal consistency and completeness, is uneven among the firms. Finally, because different interviewers asked for and recorded information differently, we have varying amounts of detail about the potential costs of HIV/AIDS and the firms' responses to the epidemic. In general, the quality of the data provided by the survey ranged from poor for the first of our three research questions to very good for the last. The discussion in the following sections reflects that variation.

The Risk of HIV/AIDS Facing the Companies in the Survey

As noted earlier in this report, no data are available to us on HIV prevalence among formally employed Nigerian men. Without these data, it is difficult to say what the true prevalence is in

the workforces of the RPED survey firms, and even more difficult to project future rates. The only data on HIV prevalence available to us come from the 1999 antenatal clinic survey described above. These data reflect rates among pregnant women using public health facilities, while the population of interest to us is formally employed men who almost all have access to private health facilities provided by their companies. Despite these limitations, we can use the 1999 antenatal clinic survey for Nigeria and our knowledge of HIV risk factors in other countries to make some tentative comments on the relative magnitude of the problem that the survey companies face from HIV/AIDS.

At the level of the individual man or woman, the risk of HIV infection is determined primarily by sexual behavior. While self-reported sexual behavior can be assessed through surveys, we do not have any behavioral survey information on Nigerian workforces.⁴¹ The alternative is to look at population-level risk factors, which tell us which sub-groups of the population are likely to engage in risky behaviors and therefore have higher HIV prevalence.

In other countries, population-level risk factors for HIV infection include age, sex, ethnicity or race, education, marital status, geographic location, housing arrangements, labor migrancy status, job level, socioeconomic status, and the presence of other STDs. The RPED survey provided good information on the composition of the Nigerian companies' workforces by job level, sex, and geographic location, and from the subsample of individual employees we can estimate their breakdown by age, ethnicity, and education (we cannot deduce marital status, housing arrangements, or the presence of other STDs). Not all risk factors matter for all populations, however, and the relative importance of the risk factors varies widely. Because culture plays such a large role in determining behavior, knowledge of which risk factors are important in South Africa or Kenya cannot readily be transferred to Nigeria.⁴² The only potential risk factor about which we have reasonable information for Nigeria is geographic location. Based on the antenatal clinic survey results, it appears that, all else equal, adults living in high-prevalence states in Nigeria are more likely to be HIV-positive than those in low-prevalence states.

In the absence of better data, we will assume that the rates among pregnant women seeking antenatal care at public clinics accurately reflect the relative risk of HIV among regions of the country, if not the absolute risk (labor migration and the socioeconomic status of formally employed workers might complicate even the relative risk among states, but we do not have information with which to determine this). For purposes of this analysis, we have aggregated the survey locations into three regions based on antenatal HIV rates from the 1999 sentinel survey, as shown in Table 9.3.

⁴¹ The surveys used to determine individual behavior are known as knowledge, attitudes, and practices surveys (KAP) and are often administered as a means to design and evaluate HIV prevention interventions.

⁴² For example, the antenatal survey estimated HIV prevalence by age as well as by region. In other countries, prevalence tends to be higher among women in the younger age groups, with rates for men catching up in the older age groups. This pattern is not consistent across countries or ethnic groups, however. We cannot assume that Nigerian men of a particular age have the same HIV prevalence as do women in the same age group, nor can we make whatever adjustment is needed. Without age-specific data on prevalence among men, we cannot assess the differential risk of HIV faced by male employees.

Table 9.3: RPED Survey Locations in Each of the HIV Risk Regions

Low-Risk Region (<5% HIV prevalence)	Medium-Risk Region (5-10% HIV prevalence)	High-Risk Region (>10% HIV prevalence)
Abia (15 firms)	Anambra (14)	Benue (5)
Enugu (3)	Lagos (98)	Kaduna (17)
Jigawa (3)	Plateau (4)	(22 firms /10% of total)
Kano (32)	(116 firms /50% of total)	
Kwara (4)		
Ogun (10)		
Oyo (17)		
River (10)		
(94 firms /40% of total)		

Although we will use the groupings in Table 9.3 to represent different levels of workforce HIV “risk,” it should be kept in mind that what they actually represent is HIV prevalence among pregnant women using public health facilities. The population of interest to us, as noted above, is formally employed men who almost all have access to private health facilities provided by their companies. There is, however, a strong correlation between the companies’ own experience with HIV/AIDS—as measured by the probability of knowing of an employee death due to AIDS or being aware of an HIV-positive employee now—and HIV risk region as shown in Table 3. Companies in the medium-risk region are 3.9 times more likely to have experience with AIDS in the workforce than companies in the low-risk region, and companies in the high risk region are 6.7 times more likely to have experience with the disease. These odds ratios confirm that antenatal clinic rates can be used as a relative measure of HIV risk in the workforce, if not as an absolute measure.⁴³

Another way we can assess the risk of HIV/AIDS facing the survey companies is to look at AIDS-related departures from their workforces so far. The 232 companies in the survey reported 165 deaths in service and 16 medical retirements last year and provided detailed information about 155 of the deaths and 15 of the retirements. The cause of death or medical retirement, with probable connection to HIV/AIDS, is shown in Table 9.4.

⁴³ As we will note later in this report, managers’ perceptions of the number of AIDS-related deaths and HIV-positive individuals in their workforces might be influenced by their knowledge of the population risk in their own state. We do not have information on actual number of deaths and infections, only on how many are known to company managers. Results in section V of this report suggest that managers are paying less attention to official statistics, however, than they are to the experience of their own workforces.

Table 9.4: Deaths and Medical Retirements in RPED Firms Last Year

Reported cause of death in service or medical retirement	Number	% of total	Related to HIV/AIDS?
Motor vehicle accident	26	15%	Very unlikely
Other accident	3	2%	Very unlikely
Violence	13	8%	Very unlikely
Heart attack or stroke	15	9%	Very unlikely
Cancer	3	2%	Unknown
Malaria	5	3%	Unknown
Chronic pain	4	2%	Unknown
Other known medical condition	17	10%	Unknown
Unknown medical condition	46	27%	Possibly (50%)
Tuberculosis	8	5%	Probably
Pneumonia	2	1%	Probably
Diarrhoea or intestinal illness	0	0%	Probably
Severe weight loss	1	1%	Probably
HIV/AIDS	27	16%	Yes
Total deaths and medical retirements last year	170	100%	
Total probably or definitely HIV-related	61	36%	

These data on cause of death or medical retirement were reported by company managers and are not drawn from death certificates or medical record reviews. We have made conservative assumptions in associating these deaths and retirements with HIV/AIDS. There is anecdotal evidence of increased industrial and other accidents in heavily HIV/AIDS affected populations in other countries, for example, but it remains very unlikely that the accidents reported above are associated with the HIV/AIDS epidemic. We cannot determine how many of the “other known medical conditions” or “unknown medical conditions” are associated with HIV. In other countries, adult deaths are often attributed to an “unknown medical condition” to spare the deceased and his or her family the social stigma associated with AIDS. A death due to a medical condition that is clearly not AIDS, in contrast, will be given its specific cause to prevent others from mistaking it for AIDS. In the absence of better data, we have conservatively attributed half of the “unknown medical conditions” to HIV.

Based on the information in Table 9.4, we can safely assume that at least one-third of the reported deaths in service and medical retirements being experienced by Nigerian manufacturing firms are due to HIV/AIDS. While this is a large proportion of deaths and medical retirements, it constitutes fewer than 2 percent of all departures from the workforce last year, as we will discuss in more detail below.

A final set of data that might indicate how much AIDS-related morbidity the companies are experiencing comes from the questionnaires that were administered to medical staff at 76 company clinics. They report that malaria and chronic pain are by far the most common conditions they see; malaria ranked first at two-thirds of the clinics, and chronic pain ranked first at a quarter. Other common diagnoses are respiratory infections, diarrhea, typhoid, injuries, and hypertension. Opportunistic infections associated with HIV/AIDS, such as tuberculosis and

pneumonia, are mentioned a few times. Only one clinic respondent mentioned HIV as a common diagnosis. Some proportion of the respiratory infections, chronic pain, diarrhea, and other general conditions are almost certainly associated with HIV, but the survey data do not allow us to estimate how large that proportion is.

The Potential Costs of HIV/AIDS to the Companies in the Survey

The impact of HIV/AIDS on an organization can be assessed in a number of ways. The most common approach is to identify and add up the specific costs incurred for each case of the disease and then aggregate across the total number of cases. This is the approach taken by the CIH in its previous work in South Africa and by the studies cited above. An alternative approach is to use a cross-sectional data set made up of firm-level data to determine whether HIV/AIDS accounts for observed differences in various measures of productivity. This is the method used by Biggs and Shah (1997b) in analyzing an earlier RPED survey data set.

The relatively low rates of HIV infection in Nigeria, compared to those in southern and eastern Africa, suggest that few Nigerian firms have had substantial experience with HIV/AIDS so far. Only 14 percent of the firms in the RPED survey reported losing an employee to AIDS in the past two years or being aware of an HIV-positive employee now. The economic and social instability of the past decade and the workforce downsizing many firms have undertaken in recent years—more than a third of the companies in the survey had fewer employees in 2001 than in 1998—might also have masked whatever impact HIV/AIDS has already had. For this reason, it is unlikely that a cross-sectional analysis that attempts to account for differences in profitability or productivity on the basis of HIV/AIDS rates will show a significant impact as of 2001.

Instead of focusing on the current or past impact of HIV/AIDS on Nigerian firms, in this report we concentrate on the potential costs of the disease to the companies at the level of the individual employee. Individual impacts can then be multiplied across the expected number of AIDS cases in each workforce as better data on HIV prevalence become available.

Direct Costs

There are two major kinds of direct costs to a firm when an employee dies in service or is forced to retire due to AIDS: retirement, disability, and medical benefits; and the costs of recruiting and training a replacement worker. As the results of the CIH research in southern Africa demonstrated, these costs can be very large (as for Company A and Company C) or very small (as for Company B).

The RPED survey provided information on the types of benefits provided by Nigerian manufacturing firms. This information is summarized in Table 9.5 below.

Table 9.5: Benefits Provided by Companies in the Survey

Type of benefit	Percentage of firms that provide this benefit	Source of funding		
		Self-financed	Outside provider	Both
Retirement, death, and disability benefits				
Pension fund—annual payments until death	19%	47%	14%	40%
Pension fund—single payment upon termination	61%	89%	4%	7%
Disability benefit	68%	72%	16%	12%
Severance or service gratuity	81%	98%	0%	2%
Reimbursement for funeral costs	61%	98%	1%	1%
Death benefit	66%	79%	9%	12%
Life insurance	31%	49%	29%	22%
Other	7%	58%	33%	8%
Medical benefits				
Health insurance	17%	68%	16%	16%
Medical care at company clinic	58%	81%	7%	12%
Other ^(a)	44%	74%	12%	14%

(a) Typically a retainer arrangement with a nearby hospital or an allowance to employees to pay for medical care.

Because we were not able to obtain many details about the benefits listed in Table 5, the figures in the table should be interpreted cautiously. Several firms that said they provide pension benefits with payments until death, for example, explained that they were referring to the National Social Insurance Trust Fund, which appears not to be functioning. Similarly, some of the firms that provide disability benefits said they were referring to workman’s compensation, which is required by law but applies only to on-the-job accidents.

Four findings from Table 9.5 stand out.

- i. First, about 87 percent of employees of Nigerian manufacturing firms are eligible for some kind of payment upon retirement for any reason (pension, provident fund, and/or service gratuity). These benefits are not unique to death and disability—all employees receive them upon terminating service—but AIDS causes payment to be moved forward in time.
- ii. Second, 79 percent of employees (or their beneficiaries) are eligible for additional payments if they die in service or take medical retirement (disability, death benefits, and/or life insurance). The cost of these benefits is likely to vary directly with the number of AIDS cases in the workforce.⁴⁴

⁴⁴ If the benefits are insured, then the company will see the costs indirectly, through its premiums. Since premiums are typically based on claims histories, however, insurance will not shield firms from these costs in the long term.

- iii. Third, nearly all employees receive some medical benefits from their companies, whether at an on-site clinic or through payment of bills at an outside private medical facility. Only 11 percent of the companies in the survey do not offer any kind of medical assistance.
- iv. Finally, fewer than a third of the firms (and for some benefits only a handful of them) rely on insurance markets to finance their benefits. Most of the firms finance the benefits out of their own budgets. Increased morbidity and mortality due to AIDS will thus have a direct and immediate impact on production costs, rather than the more gradual and indirect impact of rising insurance premiums.

Notes taken by the survey teams at a few of the firms give some indication of the magnitude of some of the benefits that Nigerian employees receive. There are several types of retirement and disability benefits. Some are payable for any kind of retirement; others pertain only to death in service or retirement due to disability. For the former, the impact of AIDS is the difference between what the firm would have paid had the employee reached normal retirement age and what is actually paid; for the latter, the entire amount can be attributed to AIDS. We describe the main kinds of benefits below.

Benefits payable upon any kind of retirement:

- *Public pension fund.* By law Nigerian employers and employees must contribute to the National Social Insurance Trust Fund (NSITF), which is supposed to provide a lifetime pension upon retirement or death in service. The employee's contribution is currently equal to 2.5 percent of salary package (base salary plus allowances), while the employer's contribution is equal to 5 percent of salary package. These contributions are substantially higher than in 2000, when the same rates were applied only to the base salary. The NSITF does not appear to be paying benefits to retirees as promised. Several companies said that their employees do not have NSITF registration numbers or accounts and that the fund is dysfunctional. One firm said that it is aware of former employees who receive monthly benefits.

If the number of premature retirements and deaths rises substantially due to the HIV/AIDS epidemic, total claims for NSITF benefits from beneficiaries might also rise and move forward in time. On the other hand, the NSITF does not appear to be functioning smoothly, and there is no information available to evaluate the extent to which contribution rates reflect claims levels. An actuarial analysis of the NSITF to assess the likely impact of HIV/AIDS might be useful for the government, and employees should be provided clearer information on the level of benefits, criteria for receiving them, and application procedures.

- *Private retirement benefits.* Sixty-one percent of the companies in the survey indicated that they have a provident fund that provides a lump-sum payment to employees upon retirement. The three companies for which we have details on this benefit all reported that it is defined contribution fund, which pays to the employee upon retirement (or the beneficiaries upon the employee's death) the sum of the employee's contributions, employer's contributions, and interest accrued. The CIH's research in South Africa indicates that HIV/AIDS does not alter the costs to a company of a defined contribution retirement fund.

- *Service gratuity.* Most of the companies surveyed provide a gratuity to employees or their beneficiaries upon retirement or death. Employees become eligible for the gratuity after a specified period of service. HIV/AIDS may reduce the number of employees who serve enough years to be eligible for the gratuity, thereby decreasing companies' costs for this benefit.

Benefits payable only upon a death in service:

- *Funeral costs.* When an employee dies in service, 61 percent of the firms absorb some or all of the cost of the funeral and transport to it.
- *Other death benefits.* Sixty-seven percent of the firms provide some other payment to beneficiaries when an employee dies in service.

For the firms for which we obtained detailed information, funeral and death benefits are shown in Table 9.6. The costs of these benefits, which vary widely among firms and are almost entirely self-financed, will clearly rise if AIDS causes mortality to increase.

Table 9.6: Death and Funeral Benefits Provided by Some Nigerian Firms

Company	Death and funeral benefits
Company 1 (TB28)	"Gift" to family of N20,000 Funeral allowance of N27,000
Company 2 (TB8)	Funeral allowance of N60,000
Company 3 (GT13)	Payment of 43 weeks of final basic salary
Company 4 (ID7)	Payment of 3 times final basic annual salary
Company 5 (JP20)	Funeral allowance of N40,000

Medical benefits:

- *Company clinic.* One hundred thirty-five companies reported that they provide medical care at onsite clinics. The companies run some of the clinics directly; others are contracted out to local hospitals that provide services at the firm's site.⁴⁵
- *Retained hospital or clinic.* Forty-four percent of the companies surveyed said they provide some other medical benefits for employees, and most of the companies specified what those benefits are. The most frequent arrangement (57 percent of those that specified) is to keep a nearby hospital or clinic on retainer for employees' use. We do not have information on what

⁴⁵ Two questions in the survey asked about the existence of a medical clinic onsite; 135 companies said they provide care at a company clinic (question LAB19A2), but only 76 said they have a clinic on site (MED01). The discrepancy may result from confusion over what constitutes a company clinic, as many firms contract a local hospital to provide medical care on the firm's premises.

level of care is provided or whether there are limits to what an individual employee can receive.⁴⁶

- *Medical allowance.* The other common medical benefit (51 percent of those that specified) is an allowance to employees to pay for medical care they obtain on their own. In some cases the allowance is specifically for dependent care, since the employee can use the company clinic or hospital on retainer; in other cases the allowance is for the employee and dependents. For the 15 firms that indicated the amount of the allowance, the median was N3,600 per employee per year.

Although medical benefits for employees appear generous, two of the six firms that were questioned more closely by the CIH team explained that HIV/AIDS is excluded from coverage. One firm in Lagos, for example, noted that it pays all medical bills for employees except for conditions that are self-inflicted. STDs, including HIV/AIDS, are considered to be self-inflicted and are therefore not covered. Another Lagos firm also specifically excludes STDs and HIV/AIDS from medical coverage.

The survey did not provide any information about the benefits that are shown in Table 9.6 but not described above: disability benefits, life insurance, and health insurance. By increasing workforce morbidity and mortality, HIV/AIDS is likely to drive up the cost of all three of these.

There is evidence from throughout Africa that HIV/AIDS has increased the cost to firms of retirement, disability, and medical benefits. Anecdotal evidence from several countries, however, indicates that firms are responding to these higher costs by reducing the level of benefits provided to employees and pursuing other strategies to avoid the costs of AIDS (Simon et al. 2000). Table 9.7 presents survey results on changes in the levels of benefits for which employees are eligible and the costs of the benefits to the firms in the past two years.

Roughly half the firms in the survey report providing higher levels of benefits to employees than they did two years ago, and roughly a fifth described current benefit levels as “much larger.” More than half the firms are paying more than they did two years ago for these benefits. This figure might be somewhat misleading, since benefits costs vary directly with workforce size. In any case, the survey offers no evidence that Nigerian firms have begun to scale back their benefits policies in response to rising costs. This could be due to government regulation (e.g. the NSITF), contractual obligations to labor unions, or a belief among managers that benefits costs are not excessive.

⁴⁶ One firm in Lagos reported that it pays the local hospital an average of N600,000 per year for medical care for its 139 employees, or an average of N4,300 per employee per year. Dependents are not covered. A firm in Kano reported an average annual medical bill of about N460,000 for its 250 employees (N1,840 per employee per year).

Table 9.7: Benefit Levels and Company Payments for Benefits Relative to Two Years Ago

Type of benefit	Benefit levels				Company payments			
	Much larger	A little larger	Same	Smaller	Much larger	A little larger	Same	Smaller
Retirement benefits	22%	29%	48%	1%	24%	33%	41%	1%
Disability benefits	19%	28%	52%	0%	21%	31%	46%	2%
Medical aid or health insurance coverage	22%	19%	58%	1%	25%	22%	52%	1%
Company-provided medical care	15%	35%	49%	1%	20%	48%	29%	3%

Indirect Costs

Indirect costs reflect the loss of labor productivity associated with HIV/AIDS. These costs include increased absenteeism for sick leave, funerals, and care of family members; reduced performance on the job on the days when sick employees do come to work; vacancies before workers lost to HIV/AIDS can be replaced; the lower productivity of new employees who have not yet come up to speed; and the time supervisors and managers spend dealing with sick employees and higher turnover.⁴⁷ These costs are notoriously difficult to measure, even with the detailed human resource and interview data that the CIH collects for its studies in southern Africa. Using a survey like that carried out in Nigeria, it is not possible to obtain the data that would allow a rigorous analysis of indirect costs. Instead, we will use CIH findings from firms in South Africa to estimate some potential indirect costs of AIDS, along with RPED survey information on vacancies.

As we discussed in the previous section, the CIH has completed detailed case studies of three companies in southern Africa. The parameters generated to make indirect cost estimates for these firms might offer an indication of the potential impacts of HIV/AIDS on the labor costs of Nigerian companies. The relevant parameters are shown in Table 9.8.

⁴⁷ There is also a set of “spinoff” indirect costs associated with high HIV/AIDS rates overall, such as a decline in workforce morale and discipline. These costs are shown in the lower right quadrant of Figure 9.1.

Table 9.8: Indirect Costs of HIV/AIDS for CIH Study Companies in Southern Africa

Parameter	Company A	Company B	Company C
Sector	Heavy industry	Agro industry	Mineral processing
Workforce size	>20,000	5,000-10,000	<1,000
Number of additional sick days in last two years before AIDS-related termination	114.9	88.6	30.4
Present value of sick days as % of average annual salary	70%	42%	16%
% productivity loss in last year of illness due to diminished performance on the job ^(a)	20%	29%	36%
Present value of productivity loss as % of average annual salary	39%	40%	52%
Number of days of supervisor's time required in last year before AIDS-related termination ^(b)	n.a.	9.5	11.5
Present value of supervisor's time as % of annual average salary	n.a.	11%	21%
Total present value of sick days, productivity loss, and supervisor's time as multiple of annual average salary	1.09 ^(c)	0.93	0.89

(a) Obtained from questionnaires administered to supervisors of employees who had terminated due to HIV/AIDS in the past 2 years. Some on-the-job productivity loss was also observed in the second-to-last year before termination.

(b) Obtained from questionnaires administered to supervisors of employees who had terminated due to HIV/AIDS in the past 2 years. The questionnaire used at Company A did not include the question about supervisor's time.

(c) Does not include supervisor's time.

As shown in Table 9.8, sick leave was utilized on 22 percent of all working days at Company A during the last two years before death or medical retirement due to AIDS, while at Company C only 6 percent of working days were lost to sick leave.⁴⁸ On-the-job productivity loss varied less, ranging from 20 to 36 percent over the last year of employment. Company C, with the smallest number of additional sick days, showed the largest on-the-job productivity loss.⁴⁹ The extra time required of supervisors was roughly the same for companies B and C (no data are available for Company A). When the present values of each of these indirect costs are added up, the result is

⁴⁸ The average rate of absenteeism reported by the Nigerian companies was low (2-5 percent) across all job levels, and 79 percent of the firms said that rates of absenteeism have not changed in the past two years. It is likely that these responses include only unauthorized absences, not authorized (paid) leave. There is little evidence from the CIH's research in South Africa that HIV/AIDS increases unauthorized absences, though at less organized or vigilant firms it might have this effect.

⁴⁹ The inverse relationship between sick leave and on-the-job productivity loss might reflect differences in company policies regarding use of sick leave. At Company A, sick leave is provided generously and with few restrictions, so workers might opt to stay home when they are sick. At Company C, fewer sick days are allowed and under more limited conditions, so sick workers might choose to go to work but end up performing poorly once they are there.

similar for all three firms: the discounted indirect costs per HIV infection are equivalent to about one year's average salary for the type of worker in question.

Using the subsample of employees who were interviewed individually, we calculated the median annual salaries for Nigerian employees at different levels of the workforce shown in Table 9.9. In addition to base salary, Nigerian workers receive a variety of allowances for housing, transport, and other needs. The salary and allowances together are called the worker's "package," and an estimate of the package, which is the total annual payment to the worker, is also shown below.

Table 9.9: Median Annual Salaries of Nigerian Employees

Job level	Median annual (base) salary (Naira)	Allowances as % of base^(a)	Median annual package (Naira)
Management and professional staff	151,200	64%	247,200
Supervisors, foremen, and technicians	81,600	58%	128,958
Sales and office workers	61,200	61%	98,400
Production, maintenance, and service workers	56,130	70%	95,310
Casuals (production workers)	48,000	50%	72,000

(a) Median of employees who provided information on both base salary and allowances.

If the loss of productivity due to HIV/AIDS among Nigerian workers is similar to that among South African workers, the figures in the far right column of Table 9.9 can be thought of as a first-order estimate of the present value of the indirect cost to a Nigerian business of a single HIV infection. Because many Nigerian businesses are operating well below capacity, however—on average, the survey firms report that they are operating at 52 percent of the capacity of their plant and equipment—the indirect costs of HIV/AIDS may be lower in Nigeria than in South Africa.

Workforce Turnover

In addition to raising a company's benefits costs and reducing the productivity of infected workers, HIV/AIDS has the potential to increase workforce turnover. As a starting point for considering this possibility for Nigerian manufacturing firms, Table 9.10 shows the number of employees hired and terminated last year for all the companies in the survey.

Table 9.10: Workforce Turnover at Nigerian Firms Last Year

Type of employee	Total number employed	Total number who left	% leaving per year	Of those who left, % who:	
				Retired due to ill health	Died
Managers and professionals	5,539	340	6%	0.3%	2.4%
Supervisors, technicians, foremen	7,653	596	8%	0.2%	2.0%
Sales and office workers	6,152	569	9%	0.5%	4.6%
Service, maintenance, production	46,005	3,398	7%	0.4%	3.7%
TOTAL	65,545	4,903	7%	0.4%	3.5%

Two findings from Table 9.10 are important. First, workforce turnover at the survey companies is moderate overall. All of the CIH study firms in southern Africa had higher annual turnover than the 7 percent average for the Nigerian firms. In the RPED surveys analyzed by Biggs and Shah (1997b), average annual attrition for large firms exceeded 7 percent in all five countries and was much higher in two (Tanzania and Zambia, at 21.5 and 18.5 percent, respectively). Second, ill health retirements and deaths in service account for only 4 percent, on average, of all departures from the workforce (and, as shown in Table 9.4, HIV/AIDS is responsible for about a third of those). The first finding suggests that even relatively low levels of HIV/AIDS mortality should be “visible” to Nigerian firms, since background turnover is modest. The second finding makes clear, however, that the epidemic is not yet having a noticeable effect on overall workforce stability. This is consistent with the conclusions drawn by Biggs and Shah in the mid-1990s.

There are two types of costs associated with workforce turnover: the cost of recruiting new workers to replace those lost to HIV/AIDS; and the cost of training those new workers.⁵⁰ Each of these activities has a direct and an indirect component. For recruiting, direct costs include advertising, travel, and relocation allowances, while indirect costs are for vacancies before new workers are replaced. For training, direct costs include course tuition and trainers’ fees; indirect costs reflect the productivity lost while replacement workers come up to speed.

We do not have good data on the direct or indirect costs of training from the RPED survey. Just under two-thirds of the RPED survey firms reported providing some formal training to staff last year, and half indicated the amount they had spent on training. The median investment in training, per employee trained, was about N8,700; actual costs ranged from a high of N400,000 per person to train six managers to a low of N150 per person to train nearly 250 production, office, and sales workers. Because there is such wide variation among the firms, it does not make sense to use an average cost to train a worker to replace one lost to HIV/AIDS. For this cost component, each company will be affected differently.

⁵⁰ In addition, high turnover can reduce the efficiency of the entire workforce by breaking up established teams, increasing the ratio of inexperienced workers to veteran workers, and so on. These impacts, which are shown in the lower right quadrant of Figure 9.1 in the introduction to this report, cannot be quantified from the RPED survey data.

In the sample of companies in southern Africa, the time required for new hires to become fully productive ranged from one week to three years and varied by job level within each firm. We cannot estimate this type of cost for the Nigerian sample. The survey did not tell us anything about the direct costs of recruiting new employees, but it did allow us to estimate the cost of vacancies, which can be quantified in terms of days or weeks of lost production. For survey firms that provided detailed information on one or more deaths or medical retirements in the past two years, the mean duration of vacancy is shown in Table 9.11.

Table 9.11: Average Duration of Vacancy Following Death or Medical Retirement

Job level	Total deaths and medical retirements	No. not replaced (% not replaced)	Mean vacancy period for those replaced
Managers and professionals	11	8 (72%)	20.5 weeks
Technicians and supervisors	12	7 (58%)	19.2 weeks
Office and sales workers	28	21 (75%)	7.1 weeks
Production and service workers	122	68 (56%)	4.6 weeks
Non-permanent workers	5	4 (80%)	1.0 week
Total	178	108 (60%)	n.a.

Perhaps the most important finding in Table 9.11 is that 60 percent of all employees who died in service or were retired for medical reasons in the past two years were not replaced. Firms might be using the loss of employees to HIV/AIDS, other illnesses, and accidents to downsize their workforces without having to retrench healthy workers. This practice, for as long as it lasts, eliminates the recruitment and training costs normally incurred due to HIV/AIDS. It may also lead the firm managers to be less concerned about HIV/AIDS in the short term than they might otherwise be. If Nigeria's economy begins to grow again, the permanent loss of experienced workers to HIV/AIDS will become a greater liability.

For those employees who were replaced, the mean vacancy periods shown in Table 9.8 are similar to those reported by the CIH study companies in southern Africa and to those found by Biggs and Shah (1997) in their analysis of 1992–1995 RPED data from five African countries.⁵¹ As we would expect, it takes longer to replace highly skilled employees than those doing more basic jobs. If large numbers of managers, technicians, and other senior staff are lost to HIV/AIDS, vacancies are likely to become a problem for the firms. Only a handful of companies have lost anyone at this level to death or medical retirement in the past two years, however. The survey did not tell us why replacing production and service workers takes a full month. It would be useful to know if the delay is due to a shortage of qualified candidates, to a burdensome bureaucracy, or to other potential constraints on hiring, such as union agreements.

⁵¹ The one exception is for technicians, for whom vacancies averaged just 3.0 weeks in the Biggs and Shah analysis. This may in part be due to differences in how skilled workers and supervisors are classified, but it does suggest a greater skills shortage in Nigeria than in the countries surveyed in the mid-1990s.

The Companies' Responses to HIV/AIDS

The final set of questions the survey was intended to answer included:

- To what extent do firm responses to HIV/AIDS reflect the likely level of risk that employees face?
- What proportion of Nigerian manufacturing firms are aware of the risks posed by HIV/AIDS and how many have taken steps to reduce the risks or mitigate their impacts?
- Why have some firms taken steps on HIV/AIDS others have not?

Methodology

To understand the companies' responses to HIV/AIDS, we hypothesized that firm action is a function of characteristics of the firm, characteristics of the disease, and the availability of information concerning the disease, as shown below:

$$\text{Firm action} = f(\text{firm} \cdot \text{characteristics})(\text{disease} \cdot \text{characteristics})(\text{information})$$

We modeled this function using logistic regression with the following dependent variables:

1. Firm has a pre-employment health check for employees.
2. Firm undertook any activities in the last accounting year to prevent HIV/AIDS among employees.
3. Firm provided HIV prevention information to employees: handed out informational materials, put up posters about HIV/AIDS, or arranged for speakers or performances about AIDS prevention.
4. Firm undertook HIV prevention activities: distributed condoms on company premises, or trained employees to serve as peer educators or counselors.
5. Managers of the company have ever discussed HIV/AIDS as a potential business concern.

The independent variables were as follows:

Firm characteristics:

- Firm is part of a family of firms or industrial group.
- Firm is listed on the Nigerian stock market.
- Ownership structure of the firm.
- Ethnic origin of the owners.
- Firm's legal rights to the business site.
- Total number of employees in 2000.
- Total annual sales in 2000.
- Firm keeps accounts on an annual basis.
- Firm has its accounts audited by an outside agency.
- Gross profits before taxes last accounting year.

- Percent of production that is directly exported.
- Company has onsite medical clinic.

Disease characteristics:

- Anyone in the company is currently HIV-positive or died or left the company in the past two years due to HIV/AIDS.
- HIV prevalence rate based upon the age- and zone-specific HIV prevalence rates in Figures 9.2–9.7 of National AIDS/STD Control Programme (1999) to estimate the average prevalence rate in each company's workforce.

Information:

- Received information from outside the company about HIV/AIDS last year.
- Received information from government.
- Received information from health or medical organization.

For each dependent variable, a logistic regression model was fit with each of the independent predictors. If that model had a statistical significance of 0.15 or less by the Likelihood Ratio Test (LRT), then that independent predictor was added to the pool of predictors that was used to fit a final multivariate model. The multivariate model was created by fitting all of the independent predictors from the pool to a model. Then in a stepwise process, those predictors that were contributing the least to the fit of the model, in terms of the LRT, were eliminated and a new model was fit. This process continued until the only remaining predictors were statistically significant at the 0.05 level or less.

The predictors that showed up most often in these fitted models were:

- Does the company have an onsite medical clinic?
- To your knowledge, is anyone in your company currently HIV positive or has anyone in your workforce died or left your company in the past two years due to HIV/AIDS?
- Did you receive any information from outside the company about HIV/AIDS last year?
- Is this firm part of a family of firms or industrial groups?

The results of the logistic regression are presented in Annex C. In the results section below, we provide a series of tables with the percentages of firms that have undertaken the specified actions. The choice of the variables and the relationships we highlight were informed by the logistic regression analysis. Statistically significant relationships highlighted in the tables were identified by bivariate logistic regression analysis.

One of the challenges in constructing the logistic regression models was addressing the large number of highly correlated predictors. For example, firms that have large numbers of employees also have large sales, they tend to belong to families of firms, and they also are more likely to have a company health clinic. When highly correlated predictors such as these are placed together in multivariate regression model, they essentially cancel each other out. The

factors presented are not the only important predictors, but ones that were chosen on the basis of the context of the analysis.

Results

The proportion of firms that have discussed HIV/AIDS as a management issue or taken specific steps to prevent HIV among employees in each of the prevalence regions is shown in Table 9.12.

Table 9.12:
Percentage of Firms That Have Undertaken Indicated Actions,
in Low, Medium, and High Prevalence Regions

Action	HIV prevalence in region:		
	Low	Medium	High
Did your company receive any information on HIV/AIDS from an outside source last year?	53.1%*	37.9%	36.4%
Have the managers of your company discussed HIV/AIDS as a potential business concern?	22.3%	22.4%	31.8%
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: hand out informational materials, put up posters, or arrange for speakers or performances about HIV/AIDS?	25.5%	33.6%	31.8%
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: distribute condoms on company premises or train employees to serve as peer educators or counselors?	7.4%	16.3%	18.1%
Does your firm have a pre-employment health check for employees?	47.8%	68.1%	68.1%
Number of companies	94	116	22

* $p < 0.05$

Fewer than one-third of the firms in the survey report having discussed or taken any action on HIV/AIDS at all last year. Of those that did act, most took the very simple and low-cost step of disseminating information through posters, handouts, or speakers. Experience in other African countries has shown that, in the absence of more active interventions such as distributing condoms or training peer educators, provision of information has little effect on HIV incidence (Jha et al. 2001). Even these more active interventions have not been shown to be effective. In any case, fewer than 20 percent of the survey companies have implemented them.⁵²

Although a greater proportion of firms in the medium and high risk regions of Nigeria appear to have taken some action on HIV/AIDS, none of the results in Table 9.12 is statistically significant

⁵² There is virtually no published evidence on the effectiveness of any workplace HIV intervention, making it difficult to judge the value of any of the actions included in Table 9.12.

at the 5 percent level.⁵³ The location-specific risk of HIV in the population at large, as reflected by antenatal survey results, does not appear to be a significant determinant of companies' decisions to take action. This could suggest that businesses are paying little heed to official statistics about HIV/AIDS. It might also indicate that population risk, as reflected by ANC prevalence, is not in fact a good proxy for workforce risk.

A better indicator of perceived workforce risk (whether or not of true risk) might be the probability that someone in the workforce has died of AIDS or is known to be HIV-positive now. Table 9.13 illustrates the importance of first-hand experience with HIV/AIDS.

**Table 9.13:
Percentage of Firms That Have Undertaken Indicated Actions,
According to Experience with HIV/AIDS in the Workforce**

Action	To your knowledge, is anyone in your company currently HIV-positive?		To your knowledge, has anyone in your workforce died or left your company in the past two years due to HIV/AIDS?	
	No	Yes	No	Yes
Have the managers of your company discussed HIV/AIDS as a potential business concern?	22.2%	40.0%	20.5%	37.9%*
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: hand out informational materials, put up posters, or arrange for speakers or performances about HIV/AIDS?	26.5%	60.0%*	24.3%	68.9%*
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: distribute condoms on company premises or train employees to serve as peer educators or counselors?	10.5%	40.0%*	9.1%	37.9%*
Does your firm have a pre-employment health check for employees?	62.4%	73.3%	56.7%	89.6%*
Number of companies	181	15	181	29

* $p < 0.05$

First-hand experience with HIV/AIDS thus appears to be a good predictor of whether a firm has taken action on the epidemic. This result is consistent with findings in both developed and

⁵³ The lack of statistical significance for some of the relationships is due not to the lack of observed differences but rather to the small numbers of companies in some of the cells.

developing countries: first-hand experience with AIDS mortality is an important determinant of behavior change. The number of Nigerian companies that have such experience is small however; overall, only 13.8 percent of the managers who responded to the survey reported knowing of an AIDS death or HIV-positive individual in the workforce (or both).

It is not possible to ascertain from the survey how closely each manager's stated experience of HIV/AIDS (i.e. knowledge of employees who have died of AIDS or are HIV-positive now) reflects what is actually happening in the workforce. Knowledge of an AIDS death or an HIV-positive employee might also depend on how well informed the manager is about AIDS and about the health of the workforce. Throughout Sub-Saharan Africa, cause of death for those with AIDS is reported as, among others, tuberculosis, pneumonia, or simply "natural causes." Managers might therefore hesitate to record an illness as AIDS even when an employee has recognizable symptoms.⁵⁴ The stigma and potential sanctions associated with AIDS in Nigeria, moreover, means that employees will go to great lengths to hide their infection from their employers. For these reasons, we suspect that far more than 14 percent of the firms in the survey have suffered an AIDS death and have HIV-positive employees now.⁵⁵

In addition to first-hand experience with AIDS, having a source of information about AIDS, and possibly a source of pressure to do something about it, is a good predictor of company action, as indicated in Table 9.14.

The encouraging news from Table 9.14 is that receiving information leads firms to take at least some action on HIV/AIDS. This points to a feasible intervention for the Nigerian government and/or nongovernmental organizations. It also underscores the value of head offices of multinational corporations circulating corporate AIDS policies and programs to their national or subnational subsidiaries. At the same time, Table 9.14 highlights how much further there is to go in ensuring that basic information about HIV/AIDS makes its way into boardrooms and executive offices.

⁵⁴ Managers' responses were similar to those of company medical staff, however. Only 18 of 63 (29 percent) onsite medical staff recalled ever having an employee die or retire due to AIDS in the years since the respondent began working for the company, and only 13 of 53 (25 percent) medical staff reported being aware of HIV-positive employees in the workforce now.

⁵⁵ Some interviewers asked if the pre-employment health exam required by most firms includes an HIV test. Of those for which an answer is recorded, 11 firms do require an HIV test, while 9 do not (one of the 11 that do requires the test for managers only). Two firms reported that, in the process of routinely testing all workers for TB, they also do an HIV test, and they dismiss those who test positive. Two others reported that they carry out pre-employment HIV tests covertly, as it is against the law to discriminate against HIV-positive applicants.

Table 9.14:
Percentage of Firms That Have Undertaken Indicated Actions,
According to Access to Information about HIV/AIDS

Action	Is your firm part of a family or firms or industrial groups?		Does your company have a health clinic?		Did your company receive any information on HIV/AIDS from an outside source last year?	
	No	Yes	No	Yes	No	Yes
Have the managers of your company discussed HIV/AIDS as a potential business concern?	22.9	22.9	19.4	31.6	15.4	33.3*
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: hand out informational materials, put up posters, or arrange for speakers or performances about HIV/AIDS?	18.3	37.5*	20.1	51.3*	11.4	54.9*
Did your firm undertake any of the following activities in the last accounting year to prevent HIV/AIDS among employees: distribute condoms on company premises or train employees to serve as peer educators or counselors?	8.0	15.9	7.8	25.0*	2.4	26.5*
Does your firm have a pre-employment health check for employees?	48.2	67.3*	47.7	84.2*	56.9	67.6
Number of Companies	87	144	149	76	123	102

* p < 0.05

Conclusions

In the introduction to this report, we presented three research questions that the AIDS module of the RPED Nigeria survey was designed to answer:

- What is the risk of HIV/AIDS in the workforces of Nigerian manufacturing companies?
- What are the types and magnitudes of costs that HIV/AIDS imposes on the companies?
- What actions are companies taking to manage the impact of HIV/AIDS among employees and what has led some firms to act while others have not?

In this section, we summarize what we have learned from the survey about these three questions and discuss the implications of the findings for Nigerian manufacturing firms, the Nigerian government, and international agencies.

Summary of Findings

What is the risk of HIV/AIDS in the workforces of Nigerian manufacturing companies?

The lack of data on HIV prevalence among Nigerian men makes it impossible to make a reliable estimate of the risk of infection in the workforces of the survey companies. Antenatal clinic data from 1999 indicate high regional variation, suggesting that some firms draw employees from a much higher risk pool than do others. The magnitude of the risk is unknown. We urgently need surveillance data on HIV prevalence among formally employed men if we are to make a reasonable assessment of risk.

Most firms have experienced few if any HIV/AIDS-related deaths or medical retirements to date, and company medical personnel report that malaria is by far the most common reason for seeking medical care. Some companies are taking steps to reduce their risk by testing job applicants for HIV or dismissing employees who are found to be HIV-positive, and it is likely that most firms routinely reject applicants who appear weak or thin, two early manifestations of HIV/AIDS. Given the incentive that HIV-positive employees have to hide their status from their employers and the resemblance of many AIDS-related conditions to those that were common in Nigeria before the epidemic (diarrhea, respiratory ailments, etc.), it is very likely that Nigerian workforces include many more HIV-positive employees than company managers believe. Since managers will not take action if they are not aware of (or refuse to believe in) the risk, finding out how many workers are infected is a very high priority.

What are the types and magnitudes of costs that HIV/AIDS imposes on the companies?

HIV/AIDS can raise production costs in myriad ways. The RPED survey provided data that allow us to gauge the magnitude of some of these costs but not to measure them in any rigorous way. The data suggest that direct costs (retirement, disability, death, and medical benefits) *per HIV/AIDS case* are substantial for many, though not all, Nigerian firms. Because there have been relatively few HIV/AIDS cases so far, however, it appears that actual costs to date have been modest. The concern for the firms is what will happen if and when AIDS mortality takes off.

As AIDS causes workforce mortality to rise, companies that provide large defined benefits to employees' families or unlimited medical care will see costs climb steeply. Experience in other parts of Africa shows that when this happens, most companies take steps to limit their exposure by cutting or capping benefits, altering conditions of employment, outsourcing unskilled tasks, and so on. There is no evidence that Nigerian firms are moving in this direction yet, but more detailed information on current and past benefits levels is needed to confirm this observation. Although most firms provide both retirement and medical benefits to employees, very few finance these benefits through insurance markets. This situation will make it more difficult for companies to manage HIV/AIDS costs as the epidemic progresses.

The survey told us little about the indirect costs of HIV/AIDS. Research on companies in southern Africa indicates that the absenteeism, on-the-job performance loss, and supervisory time average about one year's annual salary per HIV/AIDS case, in present value terms. This is probably a low estimate, but it can be taken as a starting point in understanding how AIDS affects individual labor productivity. The firms in the survey report that absenteeism is low and stable, suggesting that AIDS has not yet had a major impact on productivity.

Finally, AIDS is likely to increase turnover-related costs to firms (recruitment and training). We have little information from the survey on what these costs are. The survey did tell us that only 40 percent of employees who died in service or took medical retirement last year were replaced. It thus appears that the firms are incorporating AIDS-related terminations into their overall downsizing plans. This strategy will reduce the short-term costs of HIV/AIDS but probably cannot be sustained over time, as workforces become leaner and AIDS mortality climbs.

What actions are companies taking to manage the impact of HIV/AIDS among employees and what has led some firms to act while others have not?

The best data generated by the RPED survey are on companies' responses to HIV/AIDS. Of the 232 firms surveyed, only 72 (31 percent) reported that they took any action at all to prevent HIV among employees last year, while 54 firms (23 percent) said they have ever discussed HIV/AIDS as a potential business concern. These results imply that, as of 2001, most Nigerian business managers do not regard HIV/AIDS as a serious threat to their companies.

For the companies that did take action on HIV/AIDS last year, several predictors are important. The prevalence of HIV/AIDS in the surrounding population, as indicated by antenatal clinic data, does *not* seem to have an effect on the decisions. We speculate that either the prevalence of HIV among formally employed men is not well reflected by antenatal rates or managers' are not paying attention to official HIV statistics. Instead, the measure of risk that the companies appear to be using is their own experience with the disease—i.e., whether an employee has been lost to AIDS or is known to be HIV-positive now. Firms that have experience with AIDS are much more likely to have implemented some type of HIV intervention last year than those that do not have experience. This is an important result for planning future intervention strategies. Although we cannot alter a company's own track record with the disease, we can make managers aware of neighboring firms' experiences.

The other important predictor of action is access to information about HIV/AIDS. The information (and possibly pressure) can come from various sources: an onsite medical clinic; a corporate family or group of which the company is a part; or outside providers of information, such as a non-governmental organization or the government. This finding points to a second opportunity for intervention. A program that provides relevant and practical information about the epidemic to managers has the potential to improve business response rates, thereby creating awareness of the disease among those at risk (posters, handouts, etc.) and providing them the means to protect themselves (condom distribution, STD treatment). While these actions are not sufficient to induce behavior change, they are almost certainly necessary components of any successful intervention program.

Conclusions and Recommendations

The RPED survey allows us to draw some tentative conclusions about the implications of HIV/AIDS for Nigerian manufacturing firms and to recommend some next steps for businesses, the Nigerian government, and international agencies such as the World Bank. The data collected by the survey are not detailed or comprehensive enough to quantify costs and benefits or make definitive statements about the impact of the epidemic on the manufacturing sector. Qualifying all the conclusions and recommendations below is the need for better data across a wide range of parameters.

Conclusions

- We know almost nothing about the epidemiology of HIV among adult males in the formal sector in Nigeria. Antenatal clinic data indicate that some of the companies in the survey are drawing their workforces from populations whose HIV prevalence exceeds 10 percent, and the firms' self-reported experience with HIV is correlated to the prevalence in the local ANC population. But the population-level risk factors for formally employed males with access to private healthcare are sufficiently different than those for pregnant women using public antenatal clinics to make a direct extrapolation meaningless. The best we can say from the RPED survey results and the ANC data is that there are HIV-positive employees in most companies' workforces and that AIDS is causing some morbidity and mortality. Better data on prevalence is perhaps the single highest priority for future research.
- It is also nearly impossible to project what will happen to the epidemic in the future. The Federal Ministry of Health believes that a take-off is inevitable without a massive intervention program. The existence of high prevalence "hot spots" in some states points in that direction, as do a number of population risk factors (high incidence of STDs, high unemployment, etc.). The antenatal clinic survey now under way will greatly improve our ability to project future prevalence. Results are not expected until well into 2002, however.
- HIV/AIDS is so far having little impact on Nigerian manufacturing firms. While the direct costs per AIDS case might be quite high, the number of cases to date seems to be very small. Although AIDS accounts for a substantial share of all medical retirements and deaths in service, it caused less than 2 percent of all workforce turnover last year. Absenteeism is low and stable. Since the firms invest relatively little in training their employees, the human

capital investment they lose when a worker is lost to AIDS is small. It is clear that some companies are forestalling the potential impact of AIDS by screening job applicants and dismissing HIV-positive workers. If HIV/AIDS-related illness becomes more prevalent in the applicant pool, this strategy could worsen the skills shortage that already exists.

- Managers of Nigerian manufacturing firms, in turn, are generally not concerned about HIV/AIDS at this point in the epidemic. The survey provides several explanations for this attitude. First, the firms have very little first-hand experience with the disease—only 14 percent of them reported knowing of an AIDS death or an HIV-positive individual in the workforce (or both). Second, as noted above, the cost “indicators” of AIDS becoming a problem in the workplace—higher absenteeism and turnover, sharp increases in medical and benefits costs, management and supervisory time diverted to deal with employee morbidity and mortality—are not yet raising a red flag for Nigerian businesses. And third, Nigerian firms face very high costs for basic inputs, such as electricity and water, and for a range of transactions with the government and with private institutions like banks. It is likely that these other problems are keeping HIV/AIDS off the “top 10” list of concerns of Nigerian managers—and may continue to do so for some time to come. For this reason, expectations that business will take a leading role in fighting the epidemic in Nigeria may be unrealistic.
- On a case-by-case basis, AIDS has the potential to impose substantial costs on the RPED survey firms. Most of the companies provide generous benefits to employees who die in service or are medically retired and generous allowances for paid leave. The CIH’s research in southern Africa shows that the cost to an employer per HIV infection can be several times the infected employee’s annual salary. If AIDS-related morbidity and mortality rise sharply, the epidemic is likely to cause a measurable increase in labor costs. Given the Nigerian firms’ struggle to compete with lower-cost producers in other countries, higher labor costs are a source of concern. The results of the 2001 antenatal clinic survey should help determine whether, and when, a spike in AIDS cases and costs can be expected.
- Fewer than one-third of Nigerian firms are taking action to prevent HIV in the workforce or address its potential impacts. If AIDS-related morbidity and mortality increase, the companies are likely to be caught off guard, without programs, policies, or strategies in place. There seem to be two main reasons for their apparent complacency. First, as noted above, most firms have not experienced an AIDS death or incurred high costs that they attribute to AIDS. Second, most firms do not have ready access to information about HIV/AIDS or how to manage it. While the lack of business action on HIV/AIDS is disappointing, both of the reasons cited above point to feasible and affordable interventions by the government or other organizations.
- Practices that might violate the rights of employees (and possibly Nigerian law) appear to be common. These include covert pre-employment HIV testing, dismissal of HIV-positive employees on no grounds other than their infection status, and exclusion of HIV/AIDS from medical coverage. Further research is needed to determine how widespread and harmful these practices are and gauge the willingness of Nigerian firms to adopt workplace policies on HIV/AIDS.

Recommendations

- Carry out voluntary, anonymous, unlinked seroprevalence surveys at selected companies in various parts of the country. A good deal of preparation is needed before such surveys are possible, but the experience of other African countries (South Africa, Zambia, Botswana) demonstrates that workforce surveillance can be done successfully and is of tremendous value in understanding how HIV/AIDS will affect businesses.
- Undertake more detailed research on the potential impact of AIDS in Nigeria at a small number of firms that have reliable information systems in place. Ideally these would be the same firms that have agreed to carry our seroprevalence surveys, as described above. Detailed case studies will help fill in the gaps from the RPED survey and provide the empirical basis for interventions.
- Develop and disseminate an HIV/AIDS information kit for Nigerian business managers. The kit could include basic information about the disease, descriptions of “best practices” from businesses in other countries, models of workplace policies on AIDS, a reminder of relevant Nigerian laws protecting HIV-positive individuals, posters and handouts for employees, and so on.
- Create opportunities for business leaders who have experience with AIDS in the workforce to speak to those who do not. This might include sponsoring speakers at existing business fora or creating local business councils or committees whose purpose is to inform participants about HIV/AIDS.
- Analyze the willingness and ability of Nigerian businesses to bear the burden of HIV/AIDS among employees, rather than following the trend among some firms in South Africa and elsewhere to shift that burden onto the public sector and households. The policy and resource allocation decisions made by the Nigerian government and international agencies should reflect a realistic assessment of the contribution that businesses can make while remaining domestically and internationally competitive.

Annex C: Logistic Regression Results

Dependent variable: firm undertook activities in the last accounting year to prevent HIV/AIDS among employees.

Fitted Model

<i>Parameter</i>	<i>Estimate</i>	<i>SE</i>	<i>Chi-Square</i>	<i>Wald p-value</i>	<i>Odds Ratio</i>
Firm is part of a family of firms or industrial groups	1.08	0.37	8.66	0.0033	2.95
Firm has an onsite medical clinic	1.28	0.33	15.3452	< 0.0001	3.61
Someone in the workforce is currently HIV-positive or died or left the company in the past two years due to HIV/AIDS	1.81	0.45	06.09	< 0.0001	6.14

Dependent variable: firm has a pre-employment health check for employees.

Fitted Model

<i>Parameter</i>	<i>Estimate</i>	<i>SE</i>	<i>Chi-Square</i>	<i>Wald p-value</i>	<i>Odds Ratio</i>
Gross profits before taxes (per million Naira)	0.051	0.017	9.09	0.0026	1.05
Company has an onsite medical clinic	1.03	0.41	6.36	0.0117	2.80

Dependent variable: managers of the company have discussed HIV/AIDS as a potential business concern.

Fitted Model

<i>Parameter</i>	<i>Estimate</i>	<i>SE</i>	<i>Chi-Square</i>	<i>Wald p-value</i>	<i>Odds Ratio</i>
Received any information from outside the company about HIV/AIDS last year.	1.07	0.34	10.04	0.0015	2.92
Percent government ownership	0.0235	0.0084	7.96	0.0048	1.024
Percent foreign ownership	0.0046	0.0046	0.963	0.3265	1.005

Dependent variable: company handed out informational materials, put up posters about HIV/AIDS, or arranged for speakers or performances about AIDS prevention.

Fitted Model

<i>Parameter</i>	<i>Estimate</i>	<i>SE</i>	<i>Chi-Square</i>	<i>Wald p-value</i>	<i>Odds Ratio</i>
Firm is part of a family of firms or industrial groups	1.08	0.42	6.77	0.0093	2.95
Total number of employees in fiscal year 2000	0.00082	0.00036	5.1549	0.023	1.001
Someone in the company currently HIV-positive or someone in the workforce died or left your company in the past two years due to HIV/AIDS	1.66	0.52	10.0387	0.0015	5.24
Received any information from outside the company about HIV/AIDS last year	2.22	0.41	28.84	<0.0001	9.19

Dependent variable: company distributed condoms on company premises, or trained employees to serve as peer educators or counselors

Fitted Model

<i>Parameter</i>	<i>Estimate</i>	<i>SE</i>	<i>Chi-Square</i>	<i>Wald p-value</i>	<i>Odds Ratio</i>
Firm is listed on the Nigerian stock market	1.46	0.49	8.89	0.0029	
Someone in the company currently HIV-positive or someone in the workforce died or left your company in the past two years due to HIV/AIDS	1.59	0.51	9.85	0.0017	4.9
Received any information from outside the company about HIV/AIDS last year	2.33	0.64	13.12	0.0003	10.31

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