Industrial Disputes and Economic Development:
The Case of Nigeria*

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Growth models have emphasized the importance of savings, investment, import substitution, and export expansion in the growth of less developed countries, however, no time-series study has been done to analyze the effects of industrial disputes — industrial instability — on these variables which development economists have considered to be the conduit of economic growth. This paper attempts to partially bridge the gap by incorporating variables of industrial disputes into the savings, investment, exports, and imports equations to show the effects on Nigeria, a developing country with a growing unionized sector. The empirical results show that savings, investment, and exports decline, while imports increase due to industrial disputes. Overall, this study shows that industrial instability will retard savings, investment, and exports-oriented economic growth, therefore, labor policies which genuinely address industrial harmony may be essential for unimpeded economic growth and development in the 1990s.

I. Introduction

This paper examines the effects of industrial disputes on the economic growth of Nigeria, a developing country with a growing unionized sector. Growth studies by Leff and Sato (1975, 1980) have emphasized the importance of savings and investment for capital formation and output growth.[1] More recent studies by Eshag (1983), Laumas and Porter-Hudak (1984), Laumas (1982, 1990), Tyler (1981), and Cheng and Tang (1990) have also stressed the importance of

monetization and financial liberalization, import substitution, and export expansion in economic development.[2] Implicit in these studies is the assumption that the industrial sector of the less developed countries is peaceful with no shocks from organized labor unions. Several studies of labor unions in developing countries have classified them as political unions, and have by the developed countries' standard regarded them as weak and ineffective form of labor organizations plagued with problems of internal dissensions and rivalry. The lack of interest in examning the effects of industrial disputes on economic growth of less developed countries is predicated on the assumption that conditions in these economies would not permit the emergence of strong business unions of the American type, hence this may have led to the implicit conclusion that industrial disputes in these countries would have no impact on economic growth.

Studies by Pencavel (1977); Greer, Martin, and Reusser (1980); Hamburger (1980); and Neumann and Reder (1984) showed the effects of industrial disputes on output growth for the developed countries.[3] To the author's best knowledge, there are no time-series tests of the effects of industrial disputes on economic growth for the less developed countries, therefore, the objective of this study is to examine such effects on economic development in Nigeria. This study will further enhance our knowledge that savings, investment, import substitution, and export-oriented economic growth may be hampered if the industrial sector is plagued with labor disputes.

The paper is organized as follows. Section II briefly discusses the post-national independence industrial relations in Nigeria, while Section III discusses the specification of the savings, investment, export, and import functions by including a variable that measures industrial disputes. Section IV discusses the data and the empirical results, and Section V is devoted to the conclusions of the study.

II. Post-1960 Industrial Relations

Governments in the less developed countries have followed the lead of the developed countries by restricting trade unions actions. This is particularly true for Nigeria where trade unions were formed under the

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[2] See Eshag (1983), Laumas (1986, 1990).

[3] For a detailed discussion of results, see Whittingham and Towers (1977), Pencavel (1977), Clark (1980), Greer, Martin and Reusser (1980), Hamburger (1980), Heumann and Reder (1984).

British colonial administration. During the period under study (1960-1990), the government actively intervened in industrial relations through Wage Commissions and labor decrees. Studies have indicated that the wage policies (via Wage Commissions) of the colonial administration started with the payment of "war bonus" in 1914, and was used during the colonial period. This system continued after the colonial era because the government believed that the absence of such policy would negate development efforts and cause social frustration. Most important, the government viewed the system as an efficient way to minimize industrial disputes. There are three relevant aspects of the industrial relations in Nigeria that should be discussed briefly in order to bring out the main features of the present study.

First, voluntary collective bargaining has been an integral part of the industrial relations in Nigeria since the passage of the Trade Union Ordinance in 1939.[4] Second, market and non-market forces play significant roles in wage determination in Nigeria. Generally, in the classical framework, market-determined wages involve the forces of demand and supply. On the other hand, non-market determination of wages and salaries involves union-employer collective bargaining, and/or government intervention through wage policies. In Nigeria, government intervention in wage and salary determination is usually through appointed Wage Commissions.[5] For example, since 1941, almost all major reviews of government wages and salaries were effected by means of special Commissions or Arbitration Tribunals. Between 1940 and 1959, the Bridges, Davies, Harragin, Miller, and Gorsuch Commissions were established to set wages and salaries in the public sector, while the wages and salaries in the private sector tended to follow the recommended wage rates set by the government-appointed Commissions.[6] However, since 1955, the private employers had been reluctant to tie their rates of pay to those recommended by the Commissions.

Between 1960 and 1985, the Mbanefo, Morgan, Adebo, Udoji, Onosode Commissions, and other minimum wage policies were used to determine wages and salaries. Third, during the period under study, the Nigerian government promulgated labor decrees that prohibited

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4 See Yesufu (1962) and Kilby (1967) for discussion of trade union movement in Nigeria since 1912.

5 See Warren (1966, 1968), Kilby (1967), and Weeks (1968, 1971) for detailed discussions of wage determination in Nigeria.

6 On this point, see Federal Republic of Nigeria (1970, 1964).

strikes and lockouts.[7] The enactment of labor decrees started in 1968 during the Nigerian civil war. These decrees were enacted under the pretext of national unity in the wake of the civil war and for industrial harmony. The early decrees (decrees # 21 and # 53 of 1968 and 1969) prohibited strikes and lockouts, but the subsequent decrees broadened their coverage to specific sectors of the economy. The most significant or perhaps relevant for discussion was Decree 35 of 1975, known as The Petroleum Production and Distribution or Anti-Sabotage Decree. This decree was directed at the oil sector. It banned any form of protests by oil workers, and the most important of all, violators were subject to imprisonment without trial or capital punishment or both. Arguably, in terms of the severity of punishment, this was the toughest of all the decrees.

One important question one can ask is: Why did the Nigerian government promulgate a decree that carried a capital punishment for striking workers? There are two reaons one could be put forward to explain this severe policy measure aimed at stemming down industrial disputes. First, we should indicate that during the 1973-75 OPEC's oil supply shock, crude petroleum accounted for 84.9%, 97.9%, and 93.2% of Nigerian total exports. During the same period, Nigeria embarked on the Second National Development Plan 1975-80 which, from every indication, depended heavily on revenues from the oil sector. In effect, the government was not ready to condone strikes that would disrupt the production and transportation of crude oil. Second, one can argue that Decree 35 was intended as a general warning to the other sectors of the economy that the government would not tolerate strikes that would impede its development efforts. Ironically, there were more strikes in 1975 and 1976 associated with the implementation of the Udoji wage recommendations despite the harsh Anti-Sabotage decree. The waves of strikes that followed the implementation of the Udoji Commission could be attributed to the fact that those workers not covered by the wage recommendations of Udoji refused to yield to the threat of imprisonment without trial. These workers went on strike to demand their share of the Udoji award. In other words, they used strike to force their employers to comply with the wage rates set by Udoji. The waves of industrial unrest during this period caused production disruption which could partially explain the 5.7% and 6% fall in the share of crude petroleum in total exports.

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[7] For a detailed discussion of all the labor decrees covering the period under study, see Owoye (1989).

Several studies [e.g. Kilby (1967), Warren (1966, 1968), Weeks (1968, 1971), and Sonubi (1973)] have pointed out the effects of Wage Commissions on industrial disputes. These studies showed that strikes and man-days lost increased after each wage award. The data on strikes showed the annual average number of strikes and man-days lost to be 26, and 213,073 for the 1940-1959 period. In contrast, between 1960 and 1990, the annual average number of strikes and man-days lost increased by 360.16% and 450.31% respectively. To a large extent, the increases in the number of strikes and man-days lost during the 1960-1990 period could be attributed, partly, to the various Wage Commissions. In addition, these studies gave different reasons for the positive effects of Wage Commissions on industrial disputes (see Kilby, 1967). The chief among these reasons was the opposition of employers in the private sector to the idea of government intervention in wage determination and as a result they were reluctant to follow the wage recommendations outlined by the various Wage Commissions. Similarly, the labor unions were also opposed to government inter-ference in wage determination, although unions' opposition can be characterized as ambivalent. The point of departure in unions-employers' opposition to government intervention in wage determina-tion usually occurred when Commissions' recommendations involved wage payment, especially when such payments are retroactive. Generally, workers in the private sector have not hesitated to use strikes as weapon to force employers to comply with the wage rates set by the Commissions.[8] Another reason which Kilby (1967) pointed out was the fact that the unions and employers had no representatives in the make-up of the Wage Commissions. This also contribute to the an-tagonism which usually manifested in strikes.

III. The Models

Given the brief background on industrial relations in Nigeria, the important issue for empirical investigation is whether industrial dis-putes can inhabit the economic growth of a developing country. One way to analyze this issue is to examine the effects of industrial disputes on savings, investment, exports and imports — the conduits of eco-nomic growth. There are several savings and investment functions specified for developing countries, but the functions used in this study follow the works of Leff and Sato (1975 and 1980) because of the suc-

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8 For a brief overview of incomes policies (Wage Commissions) in Nigeria, see Owoye (1992).

cinctness and the ease with which their models can be fitted to the data of many developing countries for empirical investigation. One of the advantages of their savings and investment models is the applicability to economies, such as Nigeria, where interest rates are non-market determined.

In this study, man-days lost per labor force from work stoppages is used as the measure of industrial disputes. This variable is included as an explanatory variable in the savings, investment, export, and import functions. For the analysis of the Nigerian experience, we begin with the savings and investment functions of the form:

(1) $S_t = S(\Delta GDP_t, P_t, S_{t-1}, MDLPLF_t, MDLPLF_{t-1})$

(2) $I_t = I(\Delta GDP_t, P_t, \Delta DCR_t, MDLPLF_t, MDLPLF_{t-1})$

where S_t is the level of aggregate savings; I_t is the level of gross domestic investment; ΔGDP_t is the change in gross domestic product; P_t is the measure of inflation rate; and ΔDCR_t is the change in real domestic credit; $MDLPLF_t$, and $MDLPLF_{t-1}$ are the current and lagged values of man-days lost per labor force. The lagged dependent variable, S_{t-1}, is included to capture the dynamic effects of past savings on current savings.

There are two important theoretical issues that should be clarified with respect to the way equations (1) and (2) are specified. First, in equation (1), the focus is on the behavior of aggregate savings in event of industrial disputes although MDLPLF would influence private savings (savings of the private sector) more than government (public) savings. The focus on the behavior of aggregate savings instead of private savings is supported by previous studies such as those by Leff and Sato (1975, 1980) which argued that the behavior of aggregate savings is the most important in overall economic development. The argument here is that in an unstable industrial environment like Nigeria, increases in government savings would be offset by decreases in private savings, especially personal savings of households, due to dissavings during periods of prolonged industrial disputes, thus this would lead to decreases in aggregate savings. Based on this premise, emphasis on the aggregate savings is appropriate because of its relevance to aggregate economic development.

Second, it is important to note that a variable for interest rate has not been included as an explanatory variable in both equations. The rationale for this is that interest rates in Nigeria do not represent the

opportunity costs of holding money or the true reward for thriftiness. In addition, one can also argue that interest rates do not accurately reflect the true costs of financing investment spending in Nigeria. The problem with interest rate as an explanatory variable in empirical research for developing countries has been discussed extensively in the literature. In many cases, different proxies have been used for interest rate. Most importantly, consistent time-series observations on interest rates for the period under study are not available for Nigeria.[9]

With respect to equation (1), the empirical literature shows that changes in gross domestic product and lagged savings are positively related to current savings, while the relationship between inflation rate and savings is ambiguous because of the differences in the savings behavior of the private and public sectors during periods of inflation.[10] Similarly, economic theory suggests that changes in gross domestic product, domestic credit, and inflation rate are positively related to investment. The main empirical question to be answered by equations (1) and (2) is whether or not industrial disputes have negative effects on the levels of savings and investment in the process of economic growth. To shed some light on this issue, we include the current and lagged values of man-days lost per labor force to equation (1) to show that aggregate dissavings occur when workers are on strikes. The reason for the dissavings is that workers' income from work is zero during strike periods, thus their savings will be depleted for current consumption pending their return to work. In equation (2), the current and lagged values of industrial disputes are included to show that industrial instability has a negative effect on the level of gross domestic investment.

While the levels of aggregate domestic savings and investment are crucial for growth and development, Nigeria's trade position is also important in its development process. Generally, studies have attributed the trade imbalance of less developed economies such as Nigeria to the unfavorable terms of trade, inadequate foreign reserves, and the balance of payment problems. The other side of this argument which has never been explored empirically is the effect of production disruption or diseconomies of scale on the levels of exports and imports. As a country that exports and imports goods and services, its ability to produce for domestic consumption and export may be

9 For example, there are only 18 time-series observations (from 1970 to 1987) for either deposit or lending rate for Nigeria.
10 Formal models on the determinants of saving and investment can be found in Leff and Sato (1975, 1980).

limited by efficiency interference or prolonged production distustion, and/or resource underutilization that may stem from industrial disputes.[11] The hypothesis here is that production disruption or efficiency interference, and resource underutilization caused by industrial disputes also contribute to the trade imbalance.

With respect to the exports and imports components of aggregate output, the theoretical literature shows that exports depend on the real exchange rate, government spending, money supply, and world demand. Similarly, the demand for imports is determined by real exchange rate, income, and money supply.[12] Considering the effects of industrial disputes, the export and import equations for Nigeria can be specified as:

(3) $EXP_t = EXP(RER_t, GE_t, MS_t, WD_t, MDLPLF_t, MDLPLF_{t-1})$

(4) $IMP_t = IMP(RER_t, GDP_t, MS_t, MDLPLF_t, MDLPLF_{t-1})$

where RER_t, is the real exchange rate,[13] GE_t is the level of government spending, MS_t is the broad definition of money supply, and WD_t is the world demand for Nigerian exports. The world demand is proxied by th dollar value of the industrial countries' imports from Nigeria as reported in the DOTS.[14] The rest of variables, GDP_t, $MDLPLF_t$, and $MDLPLF_{t-1}$ are as defined before. Equation (4) does not include import restrictions as specified in some recent studies of import demand for developing countries because in the case of Nigeria, it is assumed that the volume of overt and covert smuggling should negate the effects of any import restrictions.[15]

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[11] There is a vast literature on the impact of exports on economic growth of developing countries. For a comprehensive review, see Laumas (1982), Michaely (1977), Tyler (1981), Rati (1985), Chen and Tang (1990), Fosu (1990).

[12] On the determinants of export supply by developing countries, see Kamas (1986), Ghose, Lahiri and Wadhwa (1986), Salehi-Isfahani (1989).

[13] The real exchange rate is defined as the exchange rate adjusted ratio of foreign price to the domestic price. That is: $RER = EP^{fr}/P^{dm}$, where E is the nominal exchange rate, P^{fr} is the foreign price, and P^{dm} is the domestic price. The foreign price used is that of the United States because the relevant data series are usually reported in dollars by the International Monetary Fund. This would enable us to perform the necessary conversion.

[14] DOTS is the Directory of Trade and Statistics published by the International Monetary Fund. The total industrial countries' imports (in dollars) from Nigeria as reported in the DOTS is used as the proxy for the world demnd for Nigerian exports after conversion. This procedure follows Kamas's (1986) method in which she used the real income of the United States as a proxy for the world demand for Colombian coffee.

[15] See Salehi-Isfahani (1989), Ghose, Lahiri and Wadhwa (1986).

Note that equations (1)-(4) can be estimated in levels or logarithm levels as done by previous studies, but the trade-off from doing so could be the validity of the parameter estimates. Such parameter estimates may yield spurious regression results and weak or invalid empirical inferences. Granger and Newbold (1974) showed that when the dependent and independent variables have unit roots, conventional estimation methods using observations on the levels of those variables will likely yield spurious regression results and erroneous inferences. To avoid this dilemma, we employ the new battery of econometric techniques to establish the time-series properties of these variables in order to determine the form of specification. In other words, it is essential to establish whether the estimation should use the level or first difference of each time-series. Generally, the determination of the order of specification involves the tests for stationarity (unit root) which could take form of the Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) explained in Engle and Granger (1987), Phillips (1987), Campbell and Perron (1991).[16]

The test results provided in Table 1 below show that each variable has a unit root as can be seen from the results of the logarithm (log) levels. This means that the first difference of each variable is required to attain stationarity. From the results in Table 1, we conclude that these variables are integrated of order one, that is, I(1). Therefore, in order to avoid spurious regression results and erroneous inference that may arise from log level specification, we respecified equations (1)-(4) in log first difference. These equations are now of the form (the log is omitted for simplicity):

$$(5) \quad \Delta S_t = \alpha_0 + \alpha_1 \Delta GDP_t + \alpha_2 \Delta P_t + \alpha_3 \Delta S_{t-1} + \alpha_4 \Delta MDLPLF_t$$
$$+ \alpha_5 \Delta MDLPLF_{t-1} + u_{1t}$$

$$(6) \quad \Delta I_t = \beta_0 + \beta_1 \Delta GDP_t + \beta_2 \Delta P_t + \beta_3 \Delta DCR_t + \beta_4 \Delta MDLPLF_t$$
$$+ \beta_5 \Delta MDLPLF_{t-1} + u_{2t}$$

$$(7) \quad \Delta EXP_t = \gamma_0 + \gamma_1 \Delta RER_t + \gamma_2 \Delta GE_t + \gamma_3 \Delta MS_t + \gamma_4 \Delta WD_t$$
$$+ \gamma_5 \Delta MDLPLF_t + \gamma_6 \Delta MDLPLF_{t-1} + u_{3t}$$

$$(8) \quad \Delta IMP_t = \delta_0 + \delta_1 \Delta RER_t + \delta_2 \Delta GDP_t + \delta_3 \Delta MS_t + \delta_4 \Delta MDLPLF_t$$
$$+ \delta_5 \Delta MDLPLF_{t-1} + u_{4t}$$

16 The equation used for DF and ADF tests is of the form: $\Delta X_t = \pi + \lambda t + \lambda X_{t-1}$ $+ \sum_{i=1}^{k} \delta_i \Delta X_{t-1}$. The difference between the DF test and the ADF test is that for the former

Table 1

Tests for Stationarity (ADF)

Variables	Log Levels	Log First Difference
S_t	−1.2630	−3.2467**
I_t	−1.4460	−3.4398**
P_t	1.9088	−3.7442***
GDP_t	0.2717	−3.1128**
DCR_t	−0.9822	−4.4169***
$MDLPLF_t$	−1.0816	−5.9047***
RER_t	−1.6624	−3.668***
GE_t	−0.1374	−3.3521**
MS_t	0.0724	−3.3130**
WD_t	0.0241	−3.1112**
EXP_t	0.7315	−3.5903**
IMP_t	0.0448	−3.1512**

Notes: *** significant at the 1% level.
       ** significant at the 5% level.

where u_{1t}...., and u_{4t} are the random disturbances characterized by the assumptions of the classical normal regression models.

Before we discuss the data and the estimated results of equations (5)-(8), let me discuss the signs of the coefficients of these equatons. In equation (5), it is theoretically assumed that α_1 and $\alpha_3 > 0$. The sign of α_2 is ambiguous because inflation may induce different reactions from the private and public sectors. For example, an increase in inflation may lead to forced savings in the private sector, but dissaving in the public sector.[17] In this equation, the variables of interest for empirical analysis are the current and lagged values of man-days lost per labor force and their effects on savings. Since workers in the unionized and non-unionized sectors do not earn wages during strike periods, we assume that consumption expenditures would be financed by savings,

(DF test), the last term of this equation is zero. Similarly these tests can be performed with or without the drift (π) and trend (t) terms. The null hypothesis is that the series have unit roots, that is $\gamma_i = 1$ for each variable. The null is rejected if each γ is significantly negative and the t-statistics are less (or greater in absolute values) than the critical values.
[17] Leff and Sato (1980) expected the same sign in their study of the savings functions for Argentina, Brazil, Chile, Costa Rica, Israel, and Taiwan.

therefore, this would lead to a reduction in private savings. As a result of this decrease, aggregate savings will also decrease,[18] thus it is expected that α_4 and $\alpha_5 < 0$.

In equation (6) the sign of β_1 is hypothesized to be positive because the changes in gross domestic product show possible accelerator effects and the effect of output growth on investment. Inflationary expectations could lead to increase in investment as investors take advantage of higher prices, hence $\beta_2 > 0$. In developing countries, monetary authorities can positively influence investment demand of the private sector by facilitating the availability of domestic credit, thus $\beta_3 > 0$. As we alluded to earlier, the current and lagged values of MDLPLF are included in the investment function to capture industrial instability, therefore, it is expected that β_4 and $\beta_5 < 0$. The general hypothesis is that the reduction in the levels of aggregate savings and investment during strike periods would have an adverse effect on the level of economic growth.

In equation (7), economic theory predicts that $\gamma_4 > 0$, while γ_1 and $\gamma_3 < 0$. However, the sign of γ_2 is expected to be ambiguous because of the possibility of export subsidy. In the absence of export subsidy, an expansionary fsical policy or a restrictive monetary policy would have a negative influence on the level of exports. Furthermore, economic theory suggests that an increase in RER_t would reduce exports, while an increase in foreign income would positively influence foreign demand for Nigerian exports. However, production disruption, and resource underutilization caused by industrial disputes in the export-related industries could result in lower exports, therefore, it is hypothesized that γ_5 and $\gamma_6 < 0$.

As for equation (8), theoretical and empirical studies show that an increase in real exchange rate makes imports cheaper relative to home goods, hence encouraging more imports. During the 1960s, 1970s, and 1980s, imports increased because of the strong domestic currency which made foreign goods and services cheaper relative to home produced goods and services, hence, it is expected that $\delta_1 > 0$. Similarly, an increase in gross domestic income should have a positive effect on the level of imports, thus, $\delta_2 > 0$. Furthermore, the sign of δ_3 is expected to be ambiguous because of the possibility of import financing which is common in many developing countries. The addition of $MDLPLF_t$ and $MDLPLF_{t-1}$ to the import equation is to show whether or not in-

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18 Aggregate domestic saving in this study is defined as the sum of private (personal and business) and government savings. If private savings fall in any given year due to prolonged strike duration, we should expect aggregate domestic savings to fall.

dustrial disputes would have any perceived effects on the level of imports. During the 1970-1985 period, strikes and man-days lost increased sharply because of the various wages and salaries review Commissions, hence it is predicted that δ_4 and $\delta_5 > 0$.

III. The Data and Estimated Results

This study uses annual data for the 1960-1990 period to estimate equations (5)-(8) in order to determine the impact of industrial disputes on these key growth variables. The yearly observations are drawn from various issues of the United Nation's *National Incomes Accounts Statistics,* International Monetary Fund's *International Financial Statistics* and *Directory of Trade Statistics,* and International Labor Organization's *Yearbook of Labor Statistics.*

The regression results of equations (5) and (6) are provided in Table 2, while those of equations (7) and (8) are presented in Table 3.[19] The variations in savings and investment are well explained as indicated by the coefficient of determination — the R^2. In addition, the Durbin-Watson statistics show the absence of serial correlation in both equations, indicating that the significant influences on these variables have been accounted for. The coefficient of GDP is positive and significantly different from zero in the savings equation. This is an indication that aggregate savings and gross domestic product are positively related. The coefficient of the inflation variable is negative and statistically significant in the savings equation. This parameter estimate indicates that higher inflation reduces aggregate savings in Nigeria. Furthermore, the coefficient of the lagged savings term is positive and statistically significant. This implies that savings in Nigeria is not only sluggish but also depends on the past level of savings. The coefficients of $MDLPLF_t$ and $MDLPLF_{t-1}$ are negative as predicted, but only the coefficient of $MDLPLF_t$ is statistically different from zero. This implies that industrial disputes have a negative impact on aggregate savings in the current period.

In the investment equation, the positive coefficient of inflation shows the sensitivity of gross domestic investment to inflation. This result is consistent with what Leff and Sato (1980) found for Argentina, Brazil, Chile, and Costa Rica. Similarly, the parameter estimate

[19] The estimation method used for equations (5) and (6) is consistent with the two-stage least squares (2SLS) method used by Leff and Sato to estimate savings and investment functions for Argentina, Brazil, Chile, Costa Rica, Israel, and Taiwan.

Table 2

SUMMARY OF THE REGRESSION RESULTS OF EQUATIONS
5 AND 6, 1960-1990

Explanatory Variables	Dependent Variables	
	ΔS_t	ΔI_t
Constant	−0.008	−0.014
	(0.11)	(0.34)
ΔGDP_t	0.549	0.416
	(5.33)**	(3.53)**
ΔP_t	−1.102	0.402
	(2.82)**	(2.05)**
ΔS_{t-1}	0.223	
	(1.66)*	
ΔDCR_t		0.168
		(1.89)*
$\Delta MDLPLF_t$	−0.057	−0.054
	(1.87)*	(1.73)*
$\Delta MDLPLF_{t-1}$	−0.023	−0.046
	(0.98)	(1.68)*
R^2	0.78	0.85
D.W.	2.38	2.21
Durbin-h	−1.5	

Notes: t-values are in parentheses.
    ** significant at the 5% level.
     * significant at the 10% level.

of GDP shows that gross domestic investment also responds significantly to the current change in GDP. On the other hand, the parameter estimate of the real domestic credit is positive and statistically significant. This shows that if the monetary authorities increase the amount of domestic credit available, domestic investment demand would increase. In addition, this may also mean that domestic credit is a better transmission mechanism in less developed countries. Finally, the coefficients of $MDLPLF_t$ and $MDLPLF_{t-1}$ are negative as predicted and statistically significant. This is an indication industrial disputes have a negative effect on the level of investment.

Table 3

SUMMARY OF THE REGRESSION RESULTS OF EQUATIONS 7 AND 8, 1960-1990

Explanatory Variables	Dependent Variables	
	ΔEXP_t	ΔIMP_t
Constant	−0.013	−0.042
	(0.17)	(0.77)
ΔRER_t	−0.595	0.486
	(1.83)*	(2.20)**
ΔGDP_t		0.732
		(2.04)**
ΔGE_t	0.705	
	(1.76)*	
ΔMS_t	−0.118	0.471
	(0.73)	(1.38)
ΔWD_t	0.584	
	(2.29)**	
$\Delta MDLPLF_t$	−0.101	0.004
	(2.15)**	(1.73)*
$\Delta MDLPLF_{t-1}$	−0.058	0.006
	(1.25)	(0.18)
R^2	0.88	0.76
D.W.	2.21	1.90

Notes: t-values are in parentheses.
   ** significant at the 5% level.
    * significant at the 10% level.

It is important to point out that the focus is not on the goodness-of-fit of the individual equations, but the overall effects of the current and lagged coefficients of MDLPLF. As we have seen, the parameter estimates of $MDLPLF_t$, $MDLPLF_{t-1}$ are negative and statistically significant in the investment equation while only $MDLPLF_t$ is statistically significant in the savings equation. The significance of the parameter estimates of $MDLPLF_t$ and $MDLPLF_{t-1}$ in the investment equation shows that industrial disputes have current and lagged effects on the level of gross domestic investment. If these results are taken

casually, then, one can argue that the prolonged idleness of workers due to work stoppages would negatively affect the levels of aggregate savings and investment. These effects cannot be ignored for a country like Nigeria where economic growth depends on the level of savings and investment. This is probably true for other less developed countries characterized by limited resources and low capacity utilization.

For the export equation in Table 3, the parameter estiamtes of $MDLPLF_t$ and $MDLPLF_{t-1}$ are also negative as hypothesized, but only the coefficient of $MDLPLF_t$ is statistically different from zero. This means that the effects of industrial disputes in the export sector can be felt in the current year. This result may help explain why total exports in 1975, 1978, 1981-1983, and 1986 fell by 14.83%, 17.78%, 19.8%, 16.7%, 16.71%, and 21.98% respectively.[20] We may recall from our earlier discussion that the enactment of Decree 35 and the implementation of the Udoji wage recommendations occurred in 1975. This was the first time that exports fell and imports almost doubled since the civil war. The fall in exports between 1981 and 1983 could be attributed to the fact that Nigeria was engulfed in the debate over the national minimum wage. However, exports rose slightly above its 1981 level in 1985.

In addition, the signs of the other variables are as predicted. The coefficients of real exchange rate, government expenditure, and world demand are significantly different from zero. The negative parameter estimate of the real exchange rate confirms the hypothesis that real exchange rate appreciation affects exports adversely. The coefficient of the government expenditure[21] is positive and significant, indicating the possibility of export subsidy which may act to nullify the effect of the real exchange rate in terms of exports. Finally, the coefficient of the world demand for Nigerian exports is positive and statistically significant. This shows that foreign income is important in export-oriented growth for developing economies.

In the import equation, the coefficients of current and lagged MDLPLF are positive, but only the coefficient of $MDLPLF_t$ is statistically significant. This is an indication that the rise in imports during the 1963-65, 1969-71, and 1974-76 periods coincided not only

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[20] These percentages were calculated from the export data from the *International Financial Statistics Yearbook*, 1993.

[21] We recognize the possibility of the existence of simultaneity bias when GE_t and MS_t are included as explanatory variables in the same regression equation. As an ad-hoc remedy, the omission of MS_t did not change the test results for the export equation.

with periods of real appreciation and increase in domestic income but also the increase in man-days lost from industrial disputes. The increase in man-days lost may also help to explain why imports increased substantially during these periods. For example, in 1964, imports increased by 22.5% while man-days lost increased by four times its 1963 level. In 1971, import increased by 41.73% while MDLPLF tripled. The 1975 episode which we alluded to earlier showed that imports actually increased by 73.21% as MDLPLF increased by 193.9%.[22]

The parameter estimate of RER_t is positive and significant. This result confirms the effects of the strong domestic currency prior to the mid-1980. This also supports the hypothesis that the decline in the price of imported goods relative to home goods has a positive effect on imports (see, Salehi-Isfahani (1989)). The coefficients of domestic income and money supply are also positive, but only the coefficient of domestic income is significantly different from zero. Finally, we should reiterate that the focus of the estimated equations is not the goodness-of-fits per se, although they show good fits as indicated by the R^2, but the signs and the growth implications of $MDLPLF_t$ and $MDLPLF_{t-1}$ for Nigeria, and perhaps for the other less developed countries with similar experience.

IV. Conclusions

In this paper, I have demonstrated the effects of industrial disputes on economic growth for Nigeria, a developing country with a rapidly growing unionized sector. The analysis proceeded by including the current and lagged values of man-days lost per labor force as determinants in the savings, investment, export, and import equations. The stationarity tests indicate that these equations should be estimated in logarithm first difference if one is to obtain robust results from which valid inference could be drawn. Estimation of these equations showed that the industrial disputes variables have significant influence on economic growth. These results provide some evidence that the incidence of strikes affects the level of economic growth in Nigeria.

The negative effects of man-days lost per labor force on savings, investment, and exports, and also the positive impact on imports are

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22 It is important to note that the Adebo and Udoji Wages and Salaries Review Commissions occurred in 1971 and 1975 respectively. The segments of the private sector not covered by the wage commissions went on strikes to force private employers to comply with the recommended wage guideline.

particularly important because of the economic growth implications for Nigeria, and other less developed countries with similar economic and institutinoal arrangements. The results show that prolonged strike durations would cause aggregate savings and investment to decline thus hindering capital accumulation and economic development. The decline in exports during periods of industrial unrest, as our analysis pointed out, would affect foreign exchange earnings and the balance of payment position. In effect, resource underutilization due to strike activity would cause low rates of growth in productivity, and as output and exports decline, the ability to secure a healthy balance of payment would be jeopardized. From these regression results, one can safely conclude that industrial disputes in Nigeria have negative effects on capital formation and export-oriented growth. Overall, this study shows that savings, investment, and export-oriented growth will be impeded in developing economies where the industrial sector is unstable, therefore, prudent labor policies which genuinely address industrial harmony may be essential for Nigeria if it hopes to accomplish a relatively unimpeded economic growth and development in the 1990s.

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