Private Pressure for Social Change in South Africa: The Impact of the Sullivan Principles

by

Alexandra Bernasek and Richard C. Porter*

CENTER FOR RESEARCH ON ECONOMIC DEVELOPMENT
The University of Michigan
Ann Arbor, Michigan 48109

Discussion Paper No. 125

August, 1990

Private Pressure for Social Change in South Africa:
The Impact of the Sullivan Principles

by

Alexandra Bernasek and Richard C. Porter*

* * *

*Department of Economics, The University of Michigan

Discussion Paper No. 125, August 1990
Published by the Center for Research on Economic Development
The University of Michigan, Ann Arbor, MI 48109-1220, U.S.A.

Private Pressure for Social Change in South Africa: The Impact of the Sullivan Principles

Alexandra Bernasek
Richard C. Porter

ABSTRACT

During the 1970s and 1980s, the Sullivan Principles represented an effort to bring moral pressure to bear on the operations in South Africa of large U.S. companies -- pressure to induce them to discontinue their discriminatory labor market practices and to introduce affirmative actions for higher wages, improved conditions, and better job opportunities among their nonwhite employees. In this paper, we look at the workplace data between 1972 and 1984 of samples of the firms that subscribed to the Sullivan Principles.

Employment. The signatory firms expanded their nonwhite employment, but not their white employment, much more rapidly than did the representative firm in South African manufacturing. Typically, this was achieved through growth while converting, at the margin, previously white jobs into nonwhite jobs; but some of the firms achieved the nonwhite labor growth through an unbalanced expansion that stressed the growth of traditionally nonwhite jobs.

Wage Rates. There was little evidence that nonwhite wage rates in the signatory firms rose any more rapidly than white wage rates. Nor did nonwhite wage rates rise any more rapidly in the signatory firms than in South African manufacturing in general.

Management and Supervisory Positions. There was some evidence that signatory firms increased the number of nonwhites in upper-level jobs. There was, however, only one subset of the firms in the sample for which there was a really substantial increase in nonwhite representation in management and supervisory positions. For these firms, the growth in the number of nonwhites in the top-level jobs occurred primarily through the hiring of nonwhites in place of whites. For the rest of the firms in the sample, no such change appeared.

30 August 1990

Private Pressure for Social Change in South Africa: The Impact of the Sullivan Principles

Alexandra Bernasek
Richard C. Porter[1]

I. Introduction

The horrors of apartheid have roiled the mainstream of the American conscience for forty years, and ways to hasten its demise have been sought for nearly as long. Not only have public confrontations with and sanctions against South Africa been urged, but private means of fostering change have been also attempted. During the 1970s and 1980s, the Sullivan Principles represented an effort to bring moral pressure to bear on the operations in South Africa of large U.S. companies -- pressure to induce them to discontinue their discriminatory labor market practices and to introduce affirmative actions for higher wages, improved conditions, and better job opportunities among their nonwhite employees.

In this paper, we look at the wage and employment data of a small, self-selected sample of the U.S. firms that subscribed to the Sullivan Principles in order to evaluate the extent of their commitment to the employment, wages, and advancement of their nonwhite workers.[2] Our sample suggests that the companies espousing the Sullivan Principles did in fact expand their nonwhite employment faster than other South African manufacturing firms -- and their white employment no less rapidly -- which implies either

---

1. Department of Economics, University of Michigan, Ann Arbor, MI (USA) 48109. We are indebted to Steven Miller for research assistance, especially in the material for Section II and in the excavation of the data for Sections III and IV. And we thank Robin Barlow, David Gordon, and other members of the University of Michigan Development Seminar for comments on an early draft.

2. The same data are available for a much larger sample of subscribers, indeed for most of the signatory firms, but they were reported in confidence to Arthur D. Little, which released only aggregated accounts of the wage and employment activities of the reporting firms. Our efforts to incorporate this larger sample into our work have, so far, proven unsuccessful.

that rapidly growing firms were more prone to accept the Principles or that acceptance of the Principles was not a costly act that impeded growth of the signatory firms. Wage rates of the signatories, however, rose no more rapidly than did wage rates of the rest of South African manufacturing firms, for either white or nonwhite labor, which implies that the Principles had small, if any, impact on wage rates. Finally, the firms in our sample did not seem to much increase the numbers of nonwhites in management and supervisory positions. A few firms made dramatic improvements in this area, but most made little or no progress.

The development of the Sullivan Principles, and the Principles themselves, are outlined in Section II of the paper. In Sections III and IV, we examine the changes in nonwhite employment and nonwhite wage rates, respectively, of the signatory companies, and we attempt to discover the proximate sources of these changes. These changes are compared to the aggregate of South African manufacturing in Section V. The changes in nonwhite employment in management and supervisory positions are examined in Section VI, using the same procedures developed in Section III. And in Section VII, the conclusions are brought together along with some speculations about how the Sullivan Principles might have affected the profitability of the signatories and how this in turn might have affected the way in which the signatory firms implemented the Principles.

II. The Sullivan Principles

In April 1971, the Reverend Leon Sullivan, minister of the Zion Baptist Church in Philadelphia and member of the Board of Directors of General Motors Corporation, publicly urged G.M. to close its plants in South Africa (New York Times, 9 April 1971, p. 45).[3] Only 1.29% of the stockholders supported this motion (NYT, 22 May 1971, p. 39). Within a year, Sullivan had changed his view, believing that G.M. -- and other U.S. firms in South Africa

---

3. "The 1971 annual meeting was Sullivan's first. It was the fifty-ninth for Charles Stewart Mott, then ninety-five, who had sat on General Motors board since 1913. Never in all those years had the patriarchal Mott, or anybody else, heard any G.M. director publicly dissent from any of the expressed views of management" (Kahn, 1979, p. 138). Hereafter, New York Times is abbreviated to NYT.

-- should stay there if they worked to change the system (NYT, 20 May 1972, p. 42). During the next few years, he met regularly with executives of major corporations in an effort to involve them in anti-apartheid activity.

Formal success began in March 1977 when twelve large U.S. corporations, including G.M., agreed to implement six principles in the operation of their South African facilities (NYT, 2 March 1977, p. IV-1).[4] The six principles, soon known as "The Sullivan Principles", were:

1. Nonsegregation of the races in all eating, comfort, and work facilities.

2. Equal and fair employment practices for all employees.

3. Equal pay for all employees doing equal or comparable work for the same period of time.

4. Initiation and development of training programs that will prepare, in substantial numbers, blacks and other nonwhites for supervisory, administrative, clerical, and technical jobs.

5. An increase in the number of blacks and other nonwhites in management and supervisory positions.

6. Improvement in quality of employees' lives outside the work environment in such areas as housing, transportation, schooling, recreation, and health facilities (NYT, ibid.).

This code, in the words of a New York Times editorial, "offends South Africa's custom, but not its laws or pretensions" (NYT, 15 June 1983, p. 26).[5] By the fall of 1977, over 50 companies had endorsed the Principles; and by the

---

4. The other companies: American Cyanamid, Burroughs, Caltex, Citicorp, Ford, IBM, International Harvester, Minnesota Mining and Manufacturing (3M), Mobil, Otis, and Union Carbide.

5. That statement may not have been quite true -- many of the signatory companies worried that they might be breaking some law or another. In South Africa, the government has regularly empowered itself with broad means to uphold apartheid and then selectively utilized those powers. The Terrorism Act, for example, makes anyone who advocates the discouragement of foreign investment liable to the death penalty (Kahn, 1979, pp. 144-145).

following summer, over 100 (NYT, 21 June 1977, p. 45, 15 Sept. 1977, p. IV-16, 6 July 1978, p. IV-5).

In July 1978, the Principles were expanded to include two new guidelines. One, the right of nonwhites to form and belong to government-registered unions. And two, an end to job fragmentation and restrictions on apprenticeships open to nonwhites.[6] The number of subscribers to the Principles continued to expand, reaching 145 in the fall of 1983 (NYT, 6 Nov. 1983, p. III-12) and a peak of 194 in the fall of 1986 (Alm and Jones, 1986, p. 45).[7]

Sullivan had from the start worried about the problem of monitoring the signatory firms -- "we needed some measurable way of determining just what progress was being made" (NYT, 6 July 1978, p. IV-5). A program was announced in the summer of 1978: Subscribers would submit semi-annual reports starting in September 1978 (NYT, ibid.). Evaluations of these reports were done by Arthur D. Little, which produced two reports on the activities of the signatory corporations in 1979 and one each year thereafter.[8]

The data requested, the forms required, and the grading system all changed regularly over the period, 1979-86. The 1983 questionnaire, for example, ran 55 pages, with 116 questions requiring data and essays.[9] On average, 25% of the companies were given failing grades ("needs to become more active"), and those that passed were awarded one of two grades, "making progress" (42%) or "making good progress" (33%).[10] The exact grading system

---

6. Job fragmentation is the practice of dividing a skilled job done by one white worker up into two or more less skilled -- and much less well paid -- jobs to be done by nonwhite workers.

7. A complete list of the subscribing firms and their dates of subscription is provided in Appendix A. There are 249 firms listed there, but some of these had withdrawn before others had signed.

8. The last report was produced in November 1986.

9. A shorter form was permitted for companies that were more than 50% owned by South Africans and had less than 25 employees.

10. See Appendix A. The percentages in the text sentence refer to the entire grading period, 1979-86; the percentages varied greatly from year to year. Slightly over half of the signatories were graded at some time or another.

was never divulged.[11] Fortune called it "Byzantine", claiming that "many answers aren't graded at all" and that "on occasion ... grades have been changed" (Sherman, 1984, pp. 168, 170). What appears to have been well known was that conformity with the first three principles, those relating to equality in the workplace, was a minimum condition for passing the Arthur D. Little test. But many firms pushed time and money toward the sixth principle, in the hope that this would earn them "Brownie points" in the scoring (ibid., p. 170).

Whether because of the time and cost of preparing the reports for Arthur D. Little, because of the cost of the programs undertaken to comply with the Principles, or because -- as Sullivan contended -- companies were afraid of failing their progress evaluations, signatories began to drop out of the program in the 1980s.[12] By November 1983, 29 of the 145 firms had withdrawn in the sense that they failed to pay the monitoring fees of $1,000-7,000 per year and, presumably, failed to submit regular reports (NYT, 6 Nov. 1983, p. III-12).

Six new steps were added by Sullivan to the Principles in December 1984, and they were approved by "standing ovation" at a meeting of 119 of the then 128 signatory firms (NYT, 13 Dec. 1984, p. IV-1). The new principles, often called "the second phase" or "Sullivan Two", required that the companies:

1. Use influence and support the unrestricted rights of black businesses to locate in the urban areas of the nation.

---

11. Many lists of criteria, however, have been released. In addition to the workplace principles of nonsegregation, fair employment practices, equal pay for equal work, and affirmative action for management training and employment, these involved education for non-employees, community development, and social justice.

12. Fortune estimated that the signatories spent $78 million "over the years" on schools, housing, and other social programs, and this of course counts neither the extra costs of higher wages and more expensive work environments nor any cost savings owing to more rational hiring, promoting, and employment practices (Sherman, 1984, p. 168). The signatory firms themselves (134 of them) claimed that they had spent $100 million "on" the Principles ("Fleeing", 1985, p. 138). An editorial in the New Republic stated that $230 million had been spent (Waldorf, 1987, p. 15).

2. Influence other companies in South Africa to follow the standards of equal rights principles.

3. Support the freedom of mobility of black workers to seek employment opportunities wherever they exist, and make possible provisions for adequate housing for families of employees within the proximity of workers' employment.

4. Support the ending of all apartheid laws.

5. Practice corporate civil disobedience against all apartheid laws and refrain from following the practice, policies and regulations pertaining to apartheid.

6. Use your company's financial and legal resources to assist blacks in the equal use of all public and private amenities, such as parks, beaches, schools, hospitals, transportation and housing.[13]

Moreover, Sullivan Two called for the signatories to withdraw from South Africa and support an international economic boycott of that nation if "apartheid is not actually and in fact statutorily abolished as a system and blacks do not have equal political rights and full citizen rights" by 31 May 1987.[14]

When the sun rose in June 1987 on a South Africa still under apartheid, Sullivan called on the companies to end all commercial ties to South Africa (NYT, 4 June 1987, p. 1). By that date, more than 100 American firms had already sold off their South African subsidiaries (ibid.), and more quickly followed. Between 1984 and (July) 1988, 162 U.S. companies withdrew from South Africa.[15] Most of the signatories that have not withdrawn have maintained that they intend to continue to comply with the earlier Principles.

---

13. The final two of these six were added in 1986 (NYT, 27 July 1986, p. III-27).

14. The quote again is from Sullivan, ibid.

15. As of July 1988, 149 U.S. companies still had direct investments or employees in South Africa (GAO, 1988, p. 32).

III. Changes in Nonwhite Employment by the Signatory Firms

All signatories to the Sullivan Principles were annually required to submit extensive information on their operations, including data on employment by race and job category. But those data were considered confidential by Arthur D. Little, only aggregated and summary statistics being made public in its reports. But some of the signatories, presumably those who were proud of their South African record, voluntarily passed on much of this information to the Investor Responsibility Research Center (IRRC), which in turn published it in its periodic newsletter. This is the source of our data.

The most basic labor-market aspect of the Sullivan Principles was the call for "equal and fair employment practices". In South Africa, this means resisting -- or ignoring -- the laws and customs of apartheid, all of which conspire to favor the employment of whites over nonwhites.[16] Not only should "fair" employment practices lead to an increase in the numbers of nonwhites at all rungs of the job-ladder, but another of the Sullivan Principles further called for special effort, beyond fair practices, to "increase the number of ... nonwhites in management and supervisory positions". The compliance of the Sullivan signatories can, therefore, be very basically measured by their ability to increase the relative numbers of nonwhites in their workplaces.

In order to examine change in nonwhite employment, we needed data on employment by race and job category for a single company (or plant or division) for a pair of years that was comparable across that pair of years. In the IRRC newsletter, 33 corporate entities provided at least one such pair of years with adequate and comparable data. Many provided more than one pair -- for year-pairs ranging over 1972 through 1984 -- for a total of 78 observations.[17]

---

16. See Iyengar and Porter, 1988, where computable general equilibrium simulations are used to estimate the labor reallocation, wage change, and income redistribution that would follow from a dismantling of apartheid's controls over labor markets.

17. The firms in the sample, the years of the observations, and the exact sources of the data are given in Appendix B. Some of the observations are for periods before the firms signed the Sullivan Principles, some for periods after, a distinction that we shall examine shortly. Wage data are also available for many of the observations, and they are utilized in Section IV. Frequently, the data distinguished between the employment of

At any moment of time, the number of workers in a particular firm employed in job category i who are nonwhite (n) is L_{in}, which can be written as the following identity:

$$(1) \qquad L_{in} = (L_{in}/L_i)(L_i/L)L,$$

where L_i is the total number of workers, white (w) and nonwhite (n), in job category i, and L is the total labor force of the firm.[18] Table 1 shows, as an example, the report of one of the firms for one pair of years. The information contained in such a table provides the data for one observation in our analysis of the nonwhite employment change.[19]

The total number of nonwhite employees, L_n, is simply the sum of the L_{in} across the i job rungs:

$$(2) \qquad L_n = \Sigma_i \, L_{in}.$$

What we are interested in is the change in the number of nonwhites employed between two different points of time.[20] The change in the number of nonwhite employees, ΔL_n, can be written by differencing equation (2) after substituting equation (1) into it:

Blacks, Coloreds, and Asians, but we have always aggregated such into "nonwhite" on the grounds that Sullivan (usually) called equally for the fairer treatment of all these groups.

18. Time subscripts are implicit throughout.

19. By no means did all firms provide data for every year. When there are gaps, the closest pair of comparably formatted years is utilized as the observation. In the example of 3M (Table 1), data were not provided (at least in the same format) in 1981 or 1982, and hence the derived observation refers to the three-year period, 1980-83.

20. The change in the quality of jobs opened up to nonwhites will be examined in the next section when we look at the wage rates attached to the different job categories.

Table 1

Employment in Minnesota Mining & Manufacturing (3M), 1980 and 1983

Job Rung (i)	June 1980			June 1983		
	L_{in}	L_{iw}	L_i	L_{in}	L_{iw}	L_i
A	146	3	149	158	1	159
B	204	1	205	265	3	268
C	72	2	74	63	1	64
D	18	4	22	70	0	70
E	84	6	90	50	7	57
F	32	1	33	0	0	0
G	62	11	73	96	21	117
H	39	41	80	18	34	52
I	39	51	90	24	27	51
J	15	69	84	40	98	138
K	9	54	63	10	84	94
L	5	73	78	17	103	120
M	1	72	73	7	82	89
N	1	65	66	4	81	85
O	1	46	47	2	79	81
P	0	25	25	1	30	31
Management	1	104	105	1	105	106

Notes:
1. Labor in numbers of workers.
2. See Appendix B for data restrictions. For example, Job Rung F was not reported in the 1983 report, so zeros have been entered.

$$(3) \qquad \Delta L_n = \Sigma_i (L_{in}/L_i)(L_i/L)\Delta(L_n+L_w) + \Sigma_i (L_{in}/L_i)L\Delta(L_i/L) + \Sigma_i (L_i/L)L\Delta(L_{in}/L_i) + \text{Interact},$$

where L_w is the total number of white workers employed by the firm and the final term, called "Interact", represents a collection of terms involving the products of Δ's. Finally, we collect the two ΔL_n terms on the left-hand side of the equation:

$$(4) \qquad \Delta L_n = \{\Sigma_i (L_{in}/L_i)(L_i/L)\Delta(L_w) + \Sigma_i (L_{in}/L_i)L\Delta(L_i/L) + \Sigma_i (L_i/L)L\Delta(L_{in}/L_i) + \text{Interact}\}/\{1 - \Sigma_i (L_{in}/L_i)(L_i/L)\}.$$

The first three terms in the numerator of the right-hand side of equation (4) offer a decomposition of the sources of change in the number of nonwhites employed. The first term, involving ΔL_w, indicates the extent to which nonwhite employment would have changed if the nonwhite labor force of the firm had been changed at the same rate as the white part of the labor force had changed while the job structure of employment, L_i/L, had remained unchanged. The second term, involving $\Delta(L_i/L)$, indicates the extent to which nonwhite employment would have changed as a result of the job structure altering so as to favor or disfavor already nonwhite-intensive job categories. And the third term, involving $\Delta(L_{in}/L_i)$, indicates the extent to which nonwhite employment would have changed as a result of changes in the fraction of nonwhites within particular job categories. This equation (4), and this interpretation of its three major components, underlie the estimates to be produced in this section.

There is a conceptually uninteresting but practically important problem with the application of equation (4) to the actual data of two different points of time: at which of the two points are we to evaluate the elements that precede the Δ terms? We choose, arbitrarily but hardly without precedent, to evaluate them at the arithmetic average of the earlier and the later years. Not only does this choice contain a goodly amount of common sense, but it also insures that the "Interact" term in the numerator of equation (4) involves only the product of all three Δ terms -- there remain no products of two of the three Δ terms. Precisely, the "Interact" term is then

(5) $\quad \text{Interact} = 0.25\{\Sigma_i \Delta(L_{in}/L_i)\Delta(L_i/L)\Delta L\}.$

There remain two further steps to producing the estimates. One, equation (4) is divided throughout by the earlier year value for nonwhite employment (L_n) so as to put the information into a percentage growth format. And two, since the time gap between available reports differs among observations, both between firms and between different sets of information by the same firm, all the estimates of nonwhite labor change are converted into equivalent instantaneous per annum growth rates.

By means of equation (4), the change in nonwhite labor for each observation can be decomposed into three effects:

1. The balanced change effect (i.e. the first term in equation (4), involving ΔL_w). This indicates how much change would have occurred in the nonwhite labor force if its expansion (or contraction) had taken place at the same percentage rate as did that of white employment.

2. The job structure effect (i.e. the second term in equation (4), involving $\Delta(L_i/L)$. This indicates the extent to which nonwhite employment changed because less skilled (i.e. nonwhite-labor-intensive) jobs changed more or less rapidly than did the more skilled (i.e. white-labor-intensive) jobs.

3. The nonwhitening effect (i.e. the third term in equation (4), involving $\Delta(L_{in}/L_i)$. This indicates the extent to which nonwhite employment changed because the number of nonwhites changed as a fraction of the total employment within job categories. Such changes, where they occurred, could have taken place either because of the introduction of fairer employment practices or, more dramatically, because of the initiation of affirmative-action measures.

The average per annum growth rate of nonwhite labor in the sample is shown in Table 2. Both the unweighted average and the average weighted by each firm's start-of-period nonwhite employment are given. The division into

Table 2

Division of Nonwhite Labor Change into Three Effects

Change in Variable	Unweighted Average	Weighted Average
Nonwhite Employment	4.39%	4.79%
Effects:		
Balanced Change	0.97%	-0.19%
Job Structure	-3.68	-0.95
Nonwhitening	5.53	5.49

Table 3

Distribution of Nonwhite Employment Change and Its Effects

(sorted on descending Job Structure Effects)

Sextile	Nonwhite Employment Change	Balanced Change Effect	Job Structure Effect	Nonwhitening Effect
Unweighted:				
1	19.00%	5.70%	17.32%	-2.66%
2	7.77	2.86	3.71	1.77
3	3.92	0.11	-0.75	4.34
4	4.14	1.60	-5.45	6.54
5	-2.67	-1.85	-10.98	7.94
6	-5.83	-2.57	-25.97	15.26
Weighted:				
1	16.45%	4.35%	13.37%	0.62%
2	6.48	0.10	3.20	3.46
3	4.14	0.27	-0.05	3.92
4	6.38	1.34	-5.32	9.54
5	-10.64	-7.90	-9.75	5.37
6	-1.36	-2.36	-22.49	16.10

the three effects is then given, again for both the unweighted and the weighted averages of each of the effects.[21]

The firms in this sample were, on average, taking significant steps to "nonwhiten" their workplaces.[22] The growth rate of nonwhite employment in these firms was more than completely due to the nonwhitening effect, i.e. the increased fraction of nonwhites in particular job categories. The growth rate due to the balanced change effect -- i.e. the growth rate that would have occurred if nonwhite labor had grown at the same rate as white labor -- was on average less than one percent per annum (insignificantly different from zero, and indeed negative for the weighted average); and the growth rate due to the job structure effect was on average negative by either weighting system (and significantly so for the unweighted average).

A simple look at these averages of Table 2 suggests that most of these firms implemented their Sullivan sympathies by hiring few whites, perhaps changing the job structure slightly toward the more skilled jobs, and chiefly employing nonwhites whenever and wherever expanded employment was called for. But this inference is misleading, as a closer examination of the three effects for particular observations will disclose. The three effects are not similar among firms, and there are strong patterns among the effects.

These relationships are most clearly seen by sorting the observations on the job structure effect, from highest to lowest. Table 3 shows the (unweighted) average values of the three effects and the nonwhite employment growth variable within each of the sextiles from highest to lowest job

---

21. Note that the averages of the three effects do not add up exactly to the average growth rate of nonwhite labor. This is partly due to the omission of the "Interact" effect and is partly due to the arithmetic fact that the sum of the growth rates of several variables does not equal the growth rate of the sum of those variables. In Table 2, the average "Interact" effects are -0.34% and -0.17% (for the unweighted and weighted, respectively); the growth-rate-sum problem accounts for the other 1.92% and 0.61% (for unweighted and weighted, respectively) of the overall differences.

22. Of the unweighted averages, all are significantly different from zero except the balanced change effect.

structure effect.[23] The most notable feature of Table 3 is the inverse relationship between the job structure effect and the nonwhitening effect. Figure 1 visually displays this inverse relation in a scatter diagram of the two effects for the entire sample of 78 observations.[24]

Only in the third sextile (and to somewhat lesser extent in the fourth sextile) of Table 3 do we see the sort of firm that the averages of Table 2 suggested. In these two sextiles -- and only in these two -- are there indeed firms that hire few whites, change the job structure little (and toward the greater use of skilled labor), and hire mostly nonwhites when they want to expand their labor force. Sextiles 1 and 2 and sextiles 5 and 6 tell of very different hiring patterns:

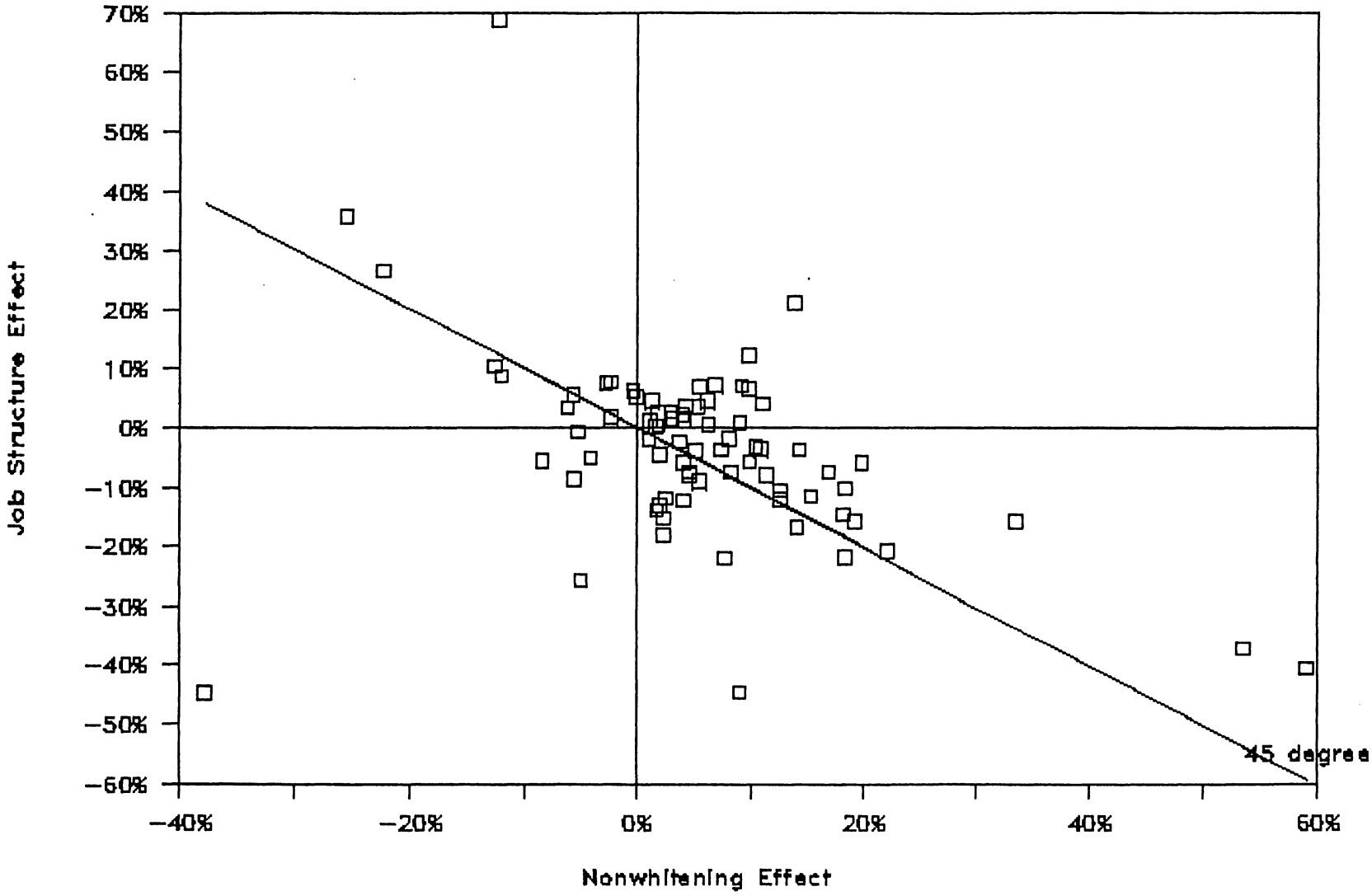
> Sextiles 1 and 2. These firms, with very large percentage growth rate in their nonwhite employment, have tended to achieve this through the job structure effect. They have expanded their employment generally but have principally expanded in jobs that were already nonwhite-intensive. Notice that within job categories, there is little or no tendency toward nonwhitening. While this pattern of employment expansion results in a gratifying increase in nonwhite employment, there is no upgrading of nonwhites into middle and top level jobs implicit in it. Rather, it is an unbalanced expansion, with emphasis on the traditionally nonwhite and low-skilled jobs.
>
> Sextiles 5 and 6. These firms have produced the worst record of nonwhite employment growth, but they have done the most upgrading of nonwhite labor. The nonwhitening effect is very large among these firms, and the job structure effect indicates that the traditionally nonwhite, low-skilled jobs have been contracted relative to the white-labor-dominated, high-skill jobs. White employment as well as nonwhite

---

23. Sextiles are a convenient division because there are then exactly 13 observations in each sextile.

24. The correlation coefficients among the three effects are: -0.44 between the effects displayed in Figure 1; also negative, -0.35, between the balanced change effect and the nonwhitening effect; and positive, +0.31, between the balanced change effect and the job structure effect.

Figure 1


70%
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
-50%
-60%
-40%
-20%
0%
20%
40%
60%
Job Structure Effect
Nonwhitening Effect
45 degree

employment has contracted, although the percentage rate of decline is generally smaller for whites.

Thus, three very different kinds of firms -- with respect to their employment practices (and general rate of expansion) -- have provided data for the IRRC-based sample. While different, they nevertheless share reason to be proud of their accomplishments, which is probably why they self-selected themselves into this sample. Firms in the sample show either dramatic upgrading of nonwhites into traditionally white positions but declines in overall nonwhite employment (Sextiles 5 and 6), or they show dramatic increases in nonwhite employment with little if any upgrading of nonwhites (Sextiles 1 and 2), or they show modest amounts of each, employment growth and upgrading for nonwhites (Sextiles 3 and 4).

We examined the growth rates of nonwhite labor and the three effects with respect to two other kinds of variables: 1) the extent to which the firm was already relatively heavily endowed with white or nonwhite labor at the start of the period of the observation; and 2) whether the firm had yet signed the Sullivan Principles and, if so, how much time had elapsed since its subscription. Small, or no, relation was noted among any of these. With respect to the former variables, this is at first a little surprising. One would think that firms that were initially very "white" would experience more "nonwhitening" through fair employment practices and/or would have more scope for affirmative action.[25] But the absence of any relation between the act of signing or the date of signing the Sullivan Principles and the employment patterns suggests the likely answer. The firms in this sample were already practicing enlightened employment policies in the early 1970s -- at least, as enlightened as their perception of continued and profitable South African operation permitted -- and their subscription to the Sullivan Principles apparently did not lead to any further (or different) liberalization of their hiring policies.

How "enlightened" were the employment policies of these self-selected firms? That is a tough question, to which we will return in the final section

---

25. The data, however, do not show that -- the rate of growth of white labor and the rate of growth of nonwhite labor were both somewhat greater for the firms that initially had the larger white-to-nonwhite labor ratios.

of the paper. But we can now see how enlightened Arthur D. Little thought these companies were. During the entire Arthur D. Little grading period (1979-86), the observations in our sample received an average grade of 1.51, compared to an average grade for all firms graded of 2.08.[26] 118 of the 146 firms that were ever graded received average grades worse than 1.51, so the firms in our sample were clearly seen by Arthur D. Little as superior implementers of the Principles.

Was there any relation between the three effects that we have measured and the grades awarded by Arthur D. Little? Yes, and always in the expected direction: Better (i.e. lower on our scale) Arthur D. Little grades were received by firms that had higher balanced change effects, or higher job structure effects, or higher nonwhitening effects. But the relationship was only significant for the nonwhitening effect (a correlation coefficient of -0.24 between the firm's average Arthur D. Little grade, on our one-to-three scale, and the estimated nonwhitening effect of the observation in the sample). This suggests that the Arthur D. Little evaluators might have been particularly alert to increases in nonwhite employment that came from converting white jobs to nonwhite jobs (as compared to increasing both whites and nonwhites in proportion or increasing nonwhite employment in the traditional nonwhite jobs). But there was an equally strong correlation between the per annum growth rate of nonwhite employment (in the sample) and the firm's grade, so an alternative explanation of the grading process is equally tenable, that the Arthur D. Little evaluators might have simply looked at the rate of growth of nonwhite employment in the firms.[27] In fact, none of

---

26. This scoring system is ours, not Arthur D. Little's. We gave 1 to "making good progress", 2 to "making (acceptable) progress", and 3 to "needs to become more active" (see Appendix A); we then averaged all the grades the firm ever received. These averages for the firms in our sample ranged from 1.00 (Citicorp and IBM) to 2.57 (Borg-Warner). Note that the 2.08 is the average grade of all the firms graded, not the average grade awarded (1.91) -- firms that received poor grades understandably tended to submit to the grading process less often.

27. By "equally strong" is meant the same correlation coefficient, -0.24. This is surprising in light of the sextile data of Table 3, but the correlation coefficient between the rate of growth of nonwhite employment and the nonwhitening effect is positive, +0.28.

these correlations is very strong -- no convincing clues about the Arthur D. Little grading criteria are uncovered.[28]

IV. Changes in Nonwhite Wage Rates in Signatory Firms

"Equal and fair employment practices", demanded by the Sullivan Principles, presumably meant that the signatory firms would reduce the barriers to nonwhite employment and advancement in their workplaces. The result of such a reduction of barriers should appear not only in increased employment of nonwhites but also in increased wage rates for nonwhites. In this section, we look at nonwhite wage rates for our self-selected sample of firms.[29]

We make use of the fact that, for many of the volunteered observations, the average wage rate is also provided, by race and by job classification. For the estimates of this section, construction of an observation requires a comparably formatted pair of years for a firm with data, by race and job-rung, for both employment and average wage rate. Many fewer firms provided adequate wage information, and the sample size drops from the 78 of Section III to 18 in this section.[30] Table 4 shows, as an example,

---

28. When we compare the average Arthur D. Little scores over each of the sextiles of Table 3, the differences are small, in both the unweighted and the weighted sample.

29. Everything in this section is done in nominal wage rates, rather than real, since we are primarily interested in comparisons with white wage rates. But the interested reader can readily make the translation. For the years covered by this sample, 1972-84, the South African Consumer Price Index rose between 10% and 15% in every year (and at an average over the period of 12.3% per annum). Of course, one must remember that the (only official) South African CPI is for a white family's consumption basket, and the extreme racial income inequality makes that an equivocal deflator for nonwhites.

30. The data come from twelve different corporate entities, with some providing multiple observations. In a few cases, the wage information was in a slightly different format, giving for each job rung, the maximum wage rate, the minimum wage rate, the average wage rate (for both whites and nonwhites together), the percentage of whites earning above-average wage rates, and the percentage of nonwhites earning above-average wage rates. From this, we were able to make what we felt was a reasonable estimate of the average wage by race for the job category. Some firms provided the wage data in U.S. dollars; these were converted back into Rand in order to

Table 4

Employment and Wage Rates in Mobil Oil, 1981 and 1984

Job Rung	March 1981				March 1984			
(i)	Lin	Yin	Liw	Yiw	Lin	Yin	Liw	Yiw
1	222	321	0		130	654	0	
2	323	344	0		317	691	0	
3	202	405	0		228	804	0	
4	98	455	19	539	85	902	10	940
5	466	521	145	584	434	1015	99	1061
6	28	608	38	736	181	1381	36	1363
7	133	736	202	782	113	1308	142	1419
8	25	819	86	895	42	1595	71	1686
9	12	822	79	1009	65	1852	97	1893
10	35	913	255	1016	38	1713	201	1935
11	7	924	153	1099	16	1846	140	2050
12	3	992	127	1358	10	2011	127	2308
13	6	1206	130	1389	6	2137	131	2619
14	1	1269	78	1516	2	2401	92	2801
15	0		61	1711	2	2942	82	3108
16	2	1456	130	2102	3	2721	175	4045

Notes:
1. Labor in numbers of workers; average wage in Rand per month.
2. Blanks in the wage columns indicate there were no employees in that job rung and race group.

the report of one of the firms on its average wage and employment by race and job category for a pair of nearby years.

The average wage in job category i of a nonwhite worker is written Y_{in} and that of a white worker is written Y_{iw}. The total wage earnings of nonwhite labor are the product of the average salary of nonwhites (Y_n) and the total number of nonwhite employees (L_n). This is simply

$$(6) \qquad Y_n L_n = \Sigma_i Y_{in} L_{in}.$$

In a similar procedure to that used with the labor data of Section III, equation (6) can be expanded into an identity involving a series of ratios:

$$(7) \qquad Y_n L_n = \Sigma_i (Y_{in}/Y_i)(Y_i/Y) Y L_{in},$$

where

$$(8) \qquad Y_i = (Y_{in} L_{in} + Y_{iw} L_{iw})/L_i \text{ and}$$

$$(9) \qquad Y = \Sigma_i Y_i L_i / L.$$

In words, the two parenthetical ratios on the right-hand side of equation (7) have the following meaning: (Y_{in}/Y_i) is the ratio of the average nonwhite wage at job rung i to the average overall wage in i; and (Y_i/Y) is the ratio of the average overall wage at job rung i to the average overall wage in the firm.

Differencing equation (7), and rearranging terms, we get

$$(10) \qquad \Delta Y_n = \{\Sigma_i (Y_{in}/Y_i)(Y_i/Y) L_{in} \Delta Y + \Sigma_i (Y_{in}/Y_i) Y L_{in} \Delta (Y_i/Y) + \Sigma_i (Y_i/Y) Y L_{in} \Delta (Y_{in}/Y_i) + \Sigma_i (Y_{in}/Y_i)(Y_i/Y) Y \Delta L_{in} - Y_n \Delta L_n + \text{Interact}\}/L_n,$$

---

keep them in comparable, nominal Rand terms. See Appendix B for further discussion of the data.

where the final term, "Interact", again represents a collection of terms involving the products of Δ's. Equation (10) is not quite ready to apply to the data because the first term on the right-hand side, involving ΔY, implicitly contains the variable of the left-hand side, ΔY_n, within it. Writing

$$(11) \qquad YL = Y_n L_n + Y_w L_w,$$

differencing (11), substituting for the Δ Y term in equation (10), and isolating the ΔY_n terms on the left, we get

$$(12) \quad \Delta Y_n = \{\Sigma_i (Y_{in}/Y_i)(Y_i/Y) L_{in} \Delta Y_w + \Sigma_i (Y_{in}/Y_i) Y L_{in} \Delta (Y_i/Y) + \Sigma_i (Y_i/Y) Y L_{in} \Delta (Y_{in}/Y_i) + \Delta L \text{ terms} + \text{Interact}\} / \{L_n - (L_n/L) \Sigma_i (Y_{in}/Y_i)(Y_i/Y) L_{in}\},$$

where the "ΔL terms" contain terms involving ΔL_w, ΔL_n, and ΔL_{in}. In the empirical work of this section, we report only the aggregate of all these labor change effects.

The four terms in the numerator of the right-hand side of equation (12), other than the "Interact" term, provide a breakdown of the sources of change in the average wage rate of the firm's nonwhite employees. The first term, involving ΔY_w, indicates the extent to which the average nonwhite wage rate would have changed if it had moved proportionately with the overall average white wage of the firm while the relative structure of wage rates, Y_i/Y and Y_{in}/Y_i, and the relative structure of employment, L_i/L and L_{in}/L_i, had all remained unchanged. The second term, involving $\Delta(Y_{in}/Y_i)$, indicates the extent to which the average nonwhite wage would have changed as a result of a change in the ratio of the nonwhite to the overall wage rate within different job categories. The third term, involving $\Delta(Y_i/Y)$, indicates the extent to which the average nonwhite wage would have changed as a result of changes in the wage structure among jobs so as to favor or disfavor nonwhite-intensive jobs. And the fourth term, involving a collection of employment-change terms, indicates the extent to which nonwhite wages changed because of the ways in which employment shifted, among job categories and between races.

This equation (12), and this interpretation of its four major components, underlie the estimates in this section.

Again, we arbitrarily evaluate the non-Δ elements of equation (12) at the arithmetic average of the earlier and the later years. And again, this procedure insures that the "Interact" term of equation (12) involves only the product of three Δ terms -- there remain no products of two of the three Δ terms (or the product of all four).[31]

Again, there are two further steps. One, equation (12) is divided throughout by the earlier year value for the average nonwhite wage rate (Y_n) so as to put the information into a percentage growth format. And two, since the time gap between the available reports differs among observations, both between firms and between different reports of the same firm, all the percentage growth estimates are converted into equivalent instantaneous per annum growth rates.

By means of equation (12), the change in the average nonwhite wage for each observation can be decomposed into four effects:

1. The balanced change effect (i.e. the first term in equation (12), involving ΔY_w). This indicates how much change would have occurred in the average nonwhite wage rate if its growth (or decline) had occurred at the same percentage rate as did the average wage rate of white workers.

2. The wage structure effect (i.e. the second term in equation (12), involving $\Delta(Y_i/Y)$). This indicates the extent to which the average nonwhite wage changed because of relative wage changes among the various

---

31. Precisely, the "Interact" of equations (10) and (12) is

$$(13) \quad \text{Interact} = 0.25\{\Sigma_i(Y_{in}/Y_i)\Delta(Y_i/Y)\Delta Y\Delta L_{in} + \Sigma_i(Y_i/Y)\Delta(Y_{in}/Y_i)\Delta Y\Delta L_{in} + \Sigma_i Y\Delta(Y_{in}/Y_i)\Delta(Y_i/Y)\Delta L_{in} + \Sigma_i L_{in}\Delta(Y_{in}/Y_i)\Delta(Y_i/Y)\Delta Y\}.$$

For completeness, the various "ΔL terms" are precisely

$$(14) \quad \Delta \text{ L terms} = \{-Y[\Sigma_i(Y_{in}/Y_i)(Y_i/Y)(L_{in}/L] - Y_n[1- \Sigma_i(Y_{in}/Y_i)(Y_i/Y)(L_{in}/L]\}\Delta L_n + \{[Y_w-Y]\Sigma_i(Y_{in}/Y_i)(Y_i/Y)(L_{in}/L)\}\Delta L_w + \{Y\Sigma_i(Y_{in}/Y_i)(Y_i/Y)\}\Delta L_{in}.$$

jobs. Nonwhites benefit to the extent that the relatively low-skill, low-wage, nonwhite-intensive job rungs received the largest wage increases.

3. The nonwhite wage effect (i.e. the third term in equation (12), involving $\Delta(Y_{in}/Y_i)$). This indicates the extent to which the average nonwhite wage changed because nonwhite wages changed differently (in percentage terms) from white wages within job categories.

4. The employment effect (i.e. the fourth term in equation (12), involving various ΔL terms.[32] This indicates how much the average nonwhite wage rate changed because of changes in the structure of employment.[33]

The unweighted average per annum growth rate of the nominal nonwhite wage rate is 11.29%, just under the average rate of inflation of the CPI in the late 1970s. In Table 5, both the unweighted and weighted (by start-of-period nonwhite employment) average nonwhite wage rate growth are presented. The weighted average growth rate of nonwhite wages is 16.83%, well above the inflation rate in this period. The division into the four effects is also given, again for both the unweighted and the weighted averages of each of the effects.[34]

Only the balanced change effect is much different from zero, and it accounts for almost the entirety of the change in nonwhite wages.[35] What

---

32. I.e. ΔL_w, ΔL_n, and ΔL_{in}. See equation (14).

33. One must be wary here since changes in the employment structure inevitably also have a direct effect on the average wage rates -- such as Y_i, Y_n, Y_w, and Y.

34. The sum of the averages of the four effects does not equal the average nonwhite wage rate rise. Again, this is due to the absence of the "Interact" effect (0.52% and 0.25% for the unweighted and weighted averages, respectively) and the fact that the sum of growth rates does not equal the growth rate of the sum (which causes differences of 1.80% and -0.64% for the unweighted and weighted averages, respectively).

35. None of the unweighted averages of the other three effects are significantly different from zero, and the weighted averages are all even closer to zero. The sizeable differences between the unweighted and the weighted figures in Table 5 is due to two outlier observations (Kellogg), where few nonwhite workers were involved.

Table 5

Division of Nonwhite Wage Rate Change into Four Effects

Change in Variable	Unweighted Average	Weighted Average
Nonwhite Wage Rate	11.29%	16.83%
Effects:		
Balanced Change	12.62%	14.50%
Wage Structure	-0.90	-0.08
Nonwhite Wage	3.28	1.20
Employment	-6.03	1.60

Table 6

Distribution of Nonwhite Wage Rate Change and Its Effects

(sorted on descending Balanced Change Effects)

Tercile	Nonwhite Wage Change	Balanced Change Effect	Wage Structure Effect	Nonwhite Wage Effect	Employment Effect
Unweighted:					
1	19.23%	24.59%	-10.73%	0.82%	1.65%
2	9.23	10.30	2.26	7.22	-14.39
3	5.41	2.97	5.79	1.79	-5.34
Weighted:					
1	21.32%	24.66%	-7.57%	0.61%	2.95%
2	11.24	10.81	3.86	-1.21	-2.42
3	15.84	3.30	6.98	4.49	3.62

these averages are saying is that movements in nonwhite wage rates in these firms paralleled, percentagewise, the movements in white wage rates. Wage rate increases were not larger in the predominantly nonwhite job categories; within job rungs, nonwhite wage rates did not rise at a faster rate than white wage rates; and employment shifts did not occur in such a way as to raise the average nonwhite wage rate.

In short, Table 5 suggests that the typical firm in this sample changed its real wage rates during the decade from the mid-1970s to the mid-1980s in across-the-board fashion. But the averages hide an interesting diversity of behavior. While the three effects other than the balanced change effect are small on average, they are not uniformly small for individual firms in the sample, and several patterns can be discerned.

These patterns can be most clearly seen by sorting the observations on the balanced change effect, from highest to lowest. Table 6 shows the (unweighted and weighted) average values of the growth rates of the average nonwhite wage rate and of the four effects within each of the terciles from highest to lowest balanced change effect.[36] There are two interesting things to be noticed in Table 6. One, only the middle of the three sets of tercile averages look much like the overall sample averages (given in Table 5). And two, the wage structure effect is strongly inversely related to the balanced change effect -- this can also be seen in Figure 2, a scatter diagram of the two effects for the entire sample of 18 observations.[37]

The wage rate story of the first and third of the terciles:

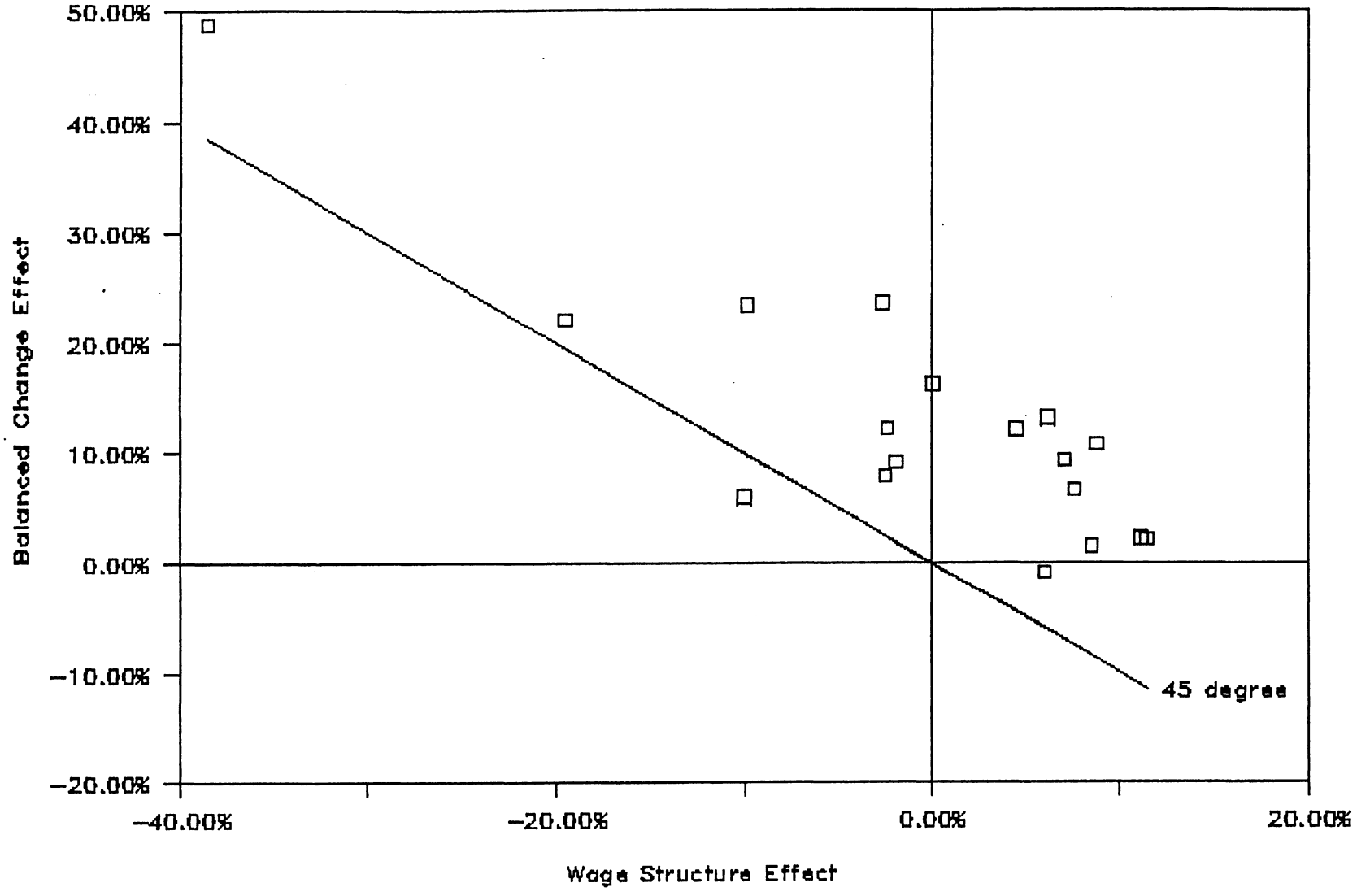
Tercile 1. These firms, with a very large percentage growth rate in their nonwhite wage rates, have an even larger percentage growth rate in their white wage rates. The wage structure effect tells us that the wage rises were largest in the white-labor-intensive job rungs. This is

---

36. With only 18 observations, no more than a threefold division seems sensible; terciles are also convenient because they place six observations in each part.

37. The correlation coefficient between the two effects is -0.86 (-0.66 if the outlier observation is removed). The other correlation coefficients among the effects are all much lower, especially if outlier observations are removed.

Figure 2


50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
-10.00%
-20.00%
Balanced Change Effect
-40.00%
-20.00%
0.00%
20.00%
Wage Structure Effect
45 degree

a paradoxical pattern if we are trying to judge these firms for their Sullivan efforts -- they display the highest nonwhite wage increases in the sample, but these increases have been bought by raising white wages and the wages of white-intensive jobs even more.

Tercile 3. For this group of firms, white wage rates rose very little, and wage increases were largest in the low-wage jobs. Beyond that, the information conveyed by the unweighted and weighted averages is very different, and we should not speculate extensively.[38] What is clear here is that these firms were doing what Sullivan had hoped for, either through freeing labor markets or through affirmative action -- raising nonwhite wage rates relative to white wage rates by increasing the wage rates of the low-skilled, nonwhite-labor-intensive jobs.

The stories of the terciles are interesting and suggestive, but it must be remembered that there are only six observations in each tercile and that none of the unweighted averages reported in Table 6 for the wage structure effect, the nonwhite wage effect, or the employment effect is significantly different from zero.

We next looked at the rates of growth of the nonwhite wage and the four effects alongside of two other variables: 1) the degree to which the labor force of the firm was relatively "white" at the start of the observation period; and 2) how much time had elapsed since the firm had signed the Sullivan Principles.[39] The higher the ratio of white to nonwhite labor at the start of the period, the lower the rate of growth of nonwhite wage rates (at the 99% level of significance). This suggests that these firms were more troubled by the need to justify nonwhite raises to their white workers than by the cost effects of such raises. That the longer the firm had subscribed to the Principles the greater the growth rate of nonwhite wages (significant at 90%) suggests that firms learned to make these justifications or that the

---

38. The difference between the unweighted and the weighted averages is accounted for by the very atypical data for one very small firm.

39. A dummy variable to indicate whether or not the firm had signed at the time of the observation was inappropriate. All but two of the firms in this sample had.

white workers learned to accept the nonwhite raises.[40] No other relationships among these effects and variables were significant at as high a level as 90%.[41]

V. Comparison of Signatory Firms with All South African Manufacturing

In Sections III and IV, we have seen that our sample of firms that signed the Sullivan Principles behaved diversely with respect to both nonwhite employment and nonwhite wage rates. This discovery of diversity of reaction is in itself interesting, indicating that firms could respond to Sullivan's call in different ways. But nothing so far has begun to answer the most interesting question: Did signatory firms behave "better" than other, non-signatory South African companies? We turn now to this question.

Ideally, we would like a control group of non-signatory companies that "look like" the signatory firms in our sample. Such an ideal is of course logically impossible, for, if they indeed looked exactly like the signatory firms, they too would have signed the Principles.[42] Practical problems abound as well. As a plausible proxy, we will use the entire South African manufacturing sector, fully recognizing that such a control group is quite imperfect. The composition of firm sizes and firm activities is very different between the Sullivan sample and the totality of South African manufacturing -- as one example of this divergence, not all the signatory firms are in manufacturing.[43]

---

40. Of course, there are other possible explanations. One is that the early Sullivan signers were more ardent supporters of the Principles than later, possibly reluctant, signers.

41. There were only insignificant relationships between the grades awarded by Arthur D. Little and the nonwhite wage growth rate or the four effects calculated here.

42. Further, since our sample is self-selected, we would ideally need a similarly self-selected control group, but such a group would necessarily select itself on different criteria.

43. That the signatory firms' data are included also in the data of the control group is not really a problem, since the Sullivan signatories comprised so small a part of the entirety of South African manufacturing. Only in one year (1981 in the larger sample of Section III) does the

Nonwhite employment grew slowly in South African manufacturing, as did white employment, during the years in question, 1972-1985.[44] Depending on how one calculates the exact growth rate, white and nonwhite employment each increased between 1.15% and 1.42% during those years.[45] But the growth rates vary greatly between different years. Employment growth rates of both races were much lower in the years 1977-1979 and 1982-1985, the very years from which most of the data of the sample used in Section III comes. So the employment growth rates in all South African manufacturing used for comparison with our Section III sample of Sullivan signatories averages the growth rates of the same years as the signatory data.

The comparison is made in Table 7. White employment in the signatory firms grew very much like the white employment of all South African manufacturing, something less than one percent per annum for the years covered by the sample of signatories. But the nonwhite employment grew much more rapidly -- between four and five percent per annum in the signatory firms on average, compared to something less than one percent for all South African manufacturing. On average, the self-selected Sullivan signatories in our sample expanded their employment much more rapidly than South African manufacturing as a whole, and they did it almost entirely with nonwhite labor.

Wage rates in South African manufacturing rose somewhat faster than inflation over the period, 1972-1985, and somewhat faster for nonwhites than whites. Depending on how one calculates the average, nominal white wage rates averaged a 12.5-13.5% growth rate over this period, and nominal nonwhite wage

---

employment of the sample firms comprise as much as one percent of the South African manufacturing total.

44. The sample of Sullivan signatories provides data from various of the years between 1972 and 1985.

45. Three methods of calculation were applied: a simple average of the annual growth rates (see Table B3 in Appendix B); the implied growth rate from the 1972 figure to the 1985 figure; and the trend coefficient estimated by regressing the natural log of employment on time, for the years 1972-1985. All three estimates, for each of white and nonwhite employment, are between 1.15% and 1.42%.

Table 7

Employment Growth of Signatory Firms and All South African Manufacturing

Change in Variable	Unweighted Average	Weighted Average
Signatory Firms:		
Nonwhite Employment	4.39%	4.79%
White Employment	0.97	-0.19
All South African Manufacturing:		
Nonwhite Employment	0.78%	0.04%
White Employment	0.56	0.36

Notes:
1. The averages for the signatory firms are from Table 2.
2. The weighted averages are weighted by the signatory firms' start-of-period nonwhite employment.

Table 8

Wage Rate Growth of Signatory Firms and All South African Manufacturing

Change in Variable	Unweighted Average	Weighted Average
Signatory Firms:		
Nonwhite Wage Rate	11.29%	16.83%
White Wage Rate	12.62	14.50
All South African Manufacturing:		
Nonwhite Wage Rate	17.37%	16.92%
White Wage Rate	15.20	15.03

Notes:
1. The averages for the signatory firms are from Table 5.
2. The weighted averages are weighted by the signatory firms' start-of-period nonwhite employment.

rates averaged a 15.1-16.4% growth rate.[46] But the sample of signatory firms to which we are going to compare all manufacturing refers to years of unusually high wage growth, so here (again) the average for all manufacturing weights each year's growth rate by the frequency of appearance of the year in the signatory sample. Average nominal wage rate growth is shown in Table 8, for the signatory firms and for all South African manufacturing, by race.

Focus on the weighted averages since the unweighted averages are much influenced by two small outlier observations.[47] It is clear that the sample of Sullivan signatories averaged wage rate increases for each race that were very similar to those experienced by all South African manufacturing.[48]

For all South African manufacturing, there is some evidence that firms tended either to increase nonwhite wages at above-average rates or to increase the nonwhite fraction of the labor force at above-average rates, but not both.[49] It would be interesting to explore this hypothesis for the Sullivan signatories, but the size of the sample of Section IV precludes it. In any case, for those few observations of signatories, such behavior is not apparent.

In short, the Sullivan signatories, according to the evidence of the self-selected samples, behaved very much like typical non-signatory South African manufacturing firms in their wage and employment growth patterns except in one respect. The Sullivan signatories increased their nonwhite employment at a much faster pace -- at 4-5% per annum compared to 0-1% for the average manufacturing firm in South Africa.

---

46. The same three methods of calculation were used as with employment earlier.

47. Small in that few nonwhites are employed (less than twenty in each observation).

48. The consumer price index (CPI) rose an average of 13.3% per annum (for the years covered by the signatory observations for both the weighted and the unweighted samples), which means that real wage rates increased 1-2% per annum for whites and 3-4% per annum for nonwhites, both for the signatory sample and for all manufacturing.

49. Over the period, 1960-1977 (Porter, 1984, pp. 135 f).

VI. Principle V -- Management and Supervisory Positions in Signatory Firms

The original Sullivan Principles required signatories to effect "an increase in the number of blacks and other nonwhites in management and supervisory positions."[50] Information about the signatory firms' efforts with respect to these highly skilled jobs was reported in the Arthur D. Little questionnaires under the heading, "Principle V", and many of the firms made this information public through the IRRC.[51]

Table 9 shows, as an example, the report of one such firm for one pair of years on its management and supervisory positions by race and by employment category. We have divided the change in nonwhite employees for each observation in exactly the same way as in Section III[52] into three effects: 1) the balanced change effect, which indicates how much change would have occurred in the number of nonwhite employees in management and supervisory positions if the change had occurred at the same percentage rate as that of white employees in these jobs; 2) the job structure effect, which indicates the extent to which these nonwhite employees changed because of differential changes in the growth of employment in white-intensive and nonwhite-intensive job categories; and 3) the nonwhitening effect, which indicates how much such nonwhite employment changed because the number of nonwhite employees changed as a percentage of the total number of employees within these management and supervisory categories.

The average per annum growth rate of nonwhite employment in the sample is shown in Table 10. Both the unweighted average and the average weighted by each firm's start-of-period nonwhite employees are given. The division into

---

50. Given the state of nonwhite education in South Africa, this amounted to a requirement not just to employ nonwhite workers in such positions but also to provide the training necessary for them to perform these jobs.

51. Our source for these data is, again, the IRRC newsletters since the Arthur D. Little material remains confidential. The data from the IRRC yielded 24 pairs of years, spread over eight firms and twelve divisions. For the data of this section, comparability across observations was not a problem; the data were reported for the same job categories (listed in Table 9) and over the same years (1977-1978) by all the firms in the sample used in this section.

52. And specifically, by equation (4).

Table 9

Management/Supervisory Jobs by Race in Masonite, Estcourt Division, 1977-1978

Training Rung (i)	January 1977			January 1978		
	L_{in}	L_{iw}	L_i	L_{in}	L_{iw}	L_i
Management and Official	1	11	12	1	19	20
Professional	4	32	36	6	28	34
Supervisor	41	46	87	63	48	111
Artisan	0	2	2	6	40	46
Technician	3	3	6	3	4	7
Clerical	87	10	97	80	8	88
Management Trainee	0	0	0	0	0	0
Total	136	104	240	159	147	306

Notes: 1. Labor in numbers of employees.
2. See Appendix B for data sources and restrictions.

Table 10

Division of Nonwhite Management Change into Three Effects

Change in Variable	Unweighted Average	Weighted Average
Nonwhite Employment	15.22%	11.21%
Effects:		
Balanced Change	4.40%	6.27%
Job Structure	-2.67	-13.03
Nonwhitening	11.57	12.49

the three effects is then given, again for both the unweighted and the weighted averages of each of the effects.[53] Although none of the effects is significantly different from zero, the double-digit size of the growth rates of nonwhite employment in these jobs and of the nonwhitening effect certainly suggests that, on average, firms expanded their nonwhite management and supervisory employment by switching from white to nonwhite labor in these categories, exactly the result that the Principles were designed to achieve.[54]

Indeed, the close relationship between the nonwhitening effect and the resulting rate of change in the numbers of nonwhites in this subset of jobs can be seen in Figure 3, where the two variables are shown on a scatter diagram. The 45-degree line is drawn to indicate the near equality of these two variables throughout the sample. The correlation coefficient is +0.92.[55]

Further insight can be gained by dividing the 24 observations into terciles, sorting on descending nonwhitening effects. This is done in Table 11. Most of the big change in nonwhite management and supervisory employment occurs in the top tercile of the observations, and that change is clearly driven by the nonwhitening effect. Thus, the conclusion of the previous paragraph should be tempered somewhat -- a few of the firms in this sample made large strides in nonwhite employment in top positions, essentially by employing nonwhites where they had previously employed whites. But the other two thirds of the firms (i.e. Terciles 2 and 3) seemed to have changed their

---

53. Note that here again the averages of the three effects do not add up exactly to the average growth rate of nonwhite labor. This is partly due to the omission of the "Interact" effect (see equation (5)) and is partly due to the arithmetic fact that the sum of the growth rates of several variables does not equal the growth rate of the sum of those variables. In Table 10, the average "Interact" effects are -0.04% and 0.06% (for the unweighted and weighted, respectively); the growth-rate-sum problem accounts for the other 1.96% and 5.42% (for unweighted and weighted, respectively) of the overall differences.

54. The large (negative) job structure effect in the weighted sample is driven almost entirely by one job category in one firm. It is the fourth (down) job category in Table 9, Artisans in the Estcourt Division of Masonite. There an all-white job category (two of two were white) in 1977 was increased 23-fold by 1978, while the overall numbers of workers in management and supervisory jobs increased by barely one fourth.

55. The correlation coefficient is +0.71 if the outlier observation is omitted.

Figure 3

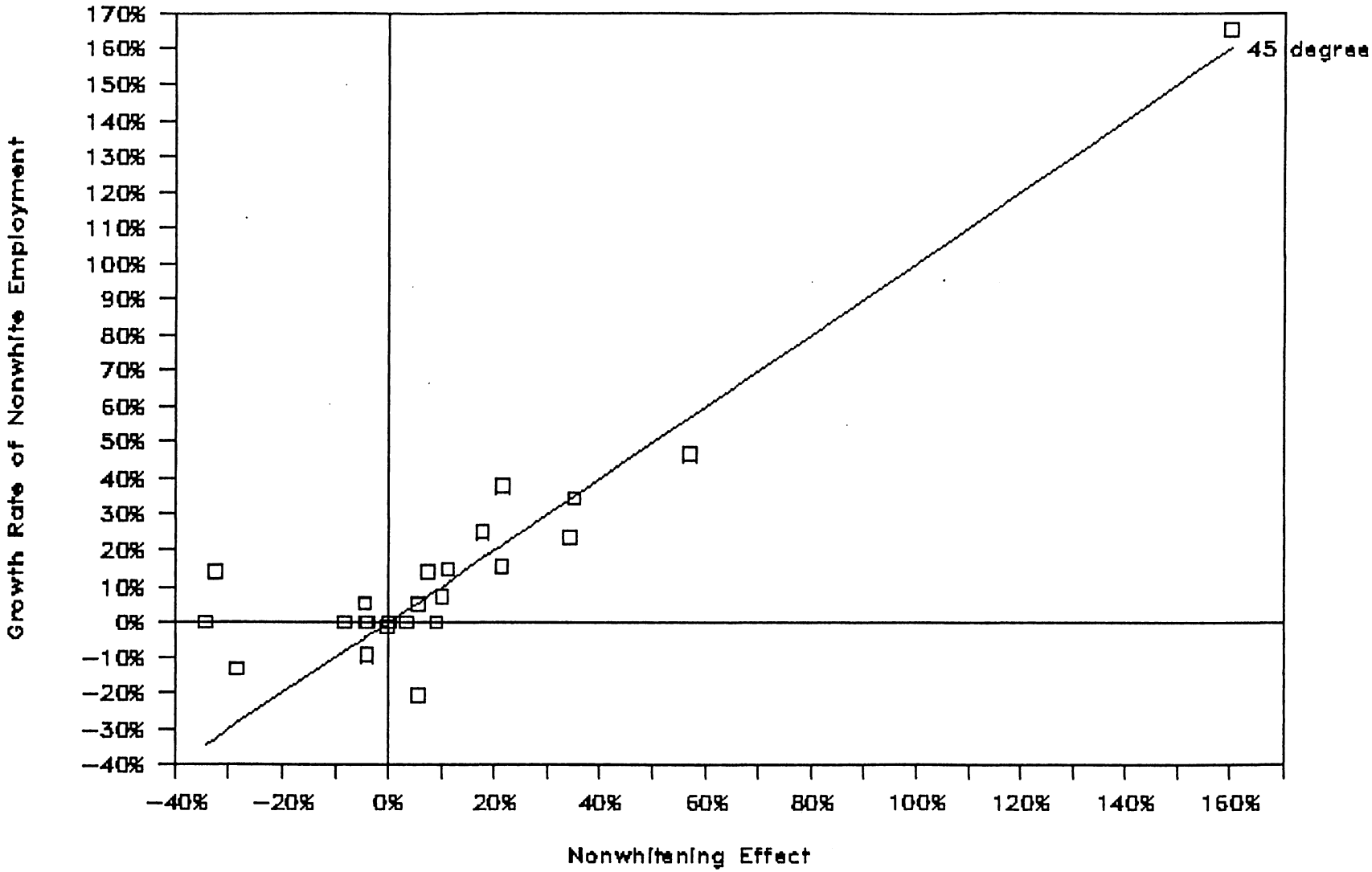

170%
160%
150%
140%
130%
120%
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
-40%
-20%
0%
20%
40%
60%
80%
100%
120%
140%
160%
45 degree
Growth Rate of Nonwhite Employment
Nonwhitening Effect

Table 11

Distribution of Nonwhite Change and Its Effects

(sorted on descending Nonwhitening Effects)

Tercile	Nonwhite Employment Change	Balanced Change Effect	Job Structure Effect	Nonwhitening Effect
Unweighted:				
1	45.52%	3.01%	-4.82%	44.73%
2	0.57	0.00	-5.10	5.04
3	-0.43	10.19	1.92	-15.08
Weighted:				
1	27.35%	12.63%	-28.30%	31.08%
2	-1.50	-2.10	-1.65	2.10
3	-0.22	10.44	-0.57	-11.62

top-level hiring procedures little, if at all.[56] In terms of Figure 3, this is seen simply by noting that some two thirds of the points in the scatter lie around, or to the left of and below, the origin. Such points indicate little change in the racial structure of the upper-level employment in these firms.

VII. Summary and Conclusions

We have looked at samples of the firms in South Africa that subscribed to the Sullivan Principles. While the samples are all small and self-selected, and hence the findings no more than suggestive, the results appear clear:

Employment. The signatory firms in the sample expanded their nonwhite employment, but not their white employment, much more rapidly than did the representative firm in South African manufacturing. Typically, this was achieved through growth while converting, at the margin, previously white jobs into nonwhite jobs; but some of the firms achieved the nonwhite labor growth through an unbalanced expansion that stressed the growth of traditionally nonwhite jobs.

Wage Rates. There was little evidence that nonwhite wage rates in the signatory firms rose any more rapidly than white wage rates. Nor did nonwhite wage rates rise any more rapidly in the signatory firms than in South African manufacturing in general.

Management and Supervisory Positions. There was some evidence that signatory firms increased the number of nonwhites in upper-level jobs. There was, however, only one subset of the firms in the sample for which there was a really substantial increase in nonwhite representation in management and supervisory positions. For these firms, the growth in the number of nonwhites in the top-level jobs occurred primarily through the hiring of nonwhites in place of whites. For the rest of the firms in the sample, no such change appeared.

---

56. Indeed, in the third tercile, the growth of employment of whites -- i.e. the balanced change effect -- greatly exceeded the growth of employment of nonwhites in these jobs.

These results are hardly surprising when we recall the pressures that apartheid puts on firms in South Africa. On the one hand, businesses benefit by being permitted to utilize a pool of low-skilled but very low-paid labor whose low wage rates are fostered by the whole system of apartheid. On the other hand, the inefficiencies of the labor markets, and especially the pressures firms face to forego employing promising black workers in high-skilled jobs, impose costs on South African businesses. When firms sign the Sullivan Principles, they are essentially promising to give up some of the benefits -- if it means paying higher wages to black workers -- in return for being "forced" to reduce some of the costs -- namely, those related to the labor-market inefficiencies. We should not be surprised to find that the signatory firms were more deft at taking advantage of the cost-reduction aspects of the Sullivan Principles than they were at bearing the burdens of the benefit-reduction aspects.

The changes in the racial aspects of the signatory firms' employment is an example of the part of apartheid that capitalists have always wanted to thwart. Firms have been prevented by formal and informal pressures from hiring cheap and talented blacks for certain jobs that have been in effect reserved for expensive, marginal whites. Subscribing to the Sullivan Principles has given these firms an excuse to accelerate the kinds of changes that it has long been in their interests to make.

Paying higher wages to blacks, however, is never in the firm's interest.[57] That signatory firms have not differed dramatically from the rest of South African manufacturing in the rate at which their nonwhite wage rates have risen is not surprising. To use nonwhites in place of marginal whites while maintaining the old wage structure is to reap the gains without paying the costs. If subscribing to the Sullivan Principles was actually turned into a profit-generating move, this would explain not only the willingness of so many firms to subscribe but also the fact that their overall employment, and presumably output, grew more rapidly than the average of all South African manufacturing firms. Big and important as the signatories were, they did not

---

57. It is sometimes argued that higher wages for nonwhites are desirable in South Africa in order to expand the markets for domestically produced consumer goods, but, whatever the merits of that argument, it is never in the interest of any individual firm to take the lead in such wage changes.

comprise a sufficiently large part of the demand for nonwhite labor in South Africa that their altered racial employment demands would, by themselves, significantly change the white-black wage differentials.

With respect to the addition of nonwhites at the management and supervisory levels, the profit motives of the firms are clearly mixed. Such changes involve benefits insofar as there are talented nonwhite employees available who can do these jobs better and cheaper than the current white job-holders can. This motive for change is most forceful at the lowest rung of the management ladder, where the best nonwhites are precluded from rising and the least talented whites reside. On the other hand, there are costs to these changes. One, given the state of nonwhite education in South Africa, the cheapness of nonwhite labor is at least partly offset by the fact that in-firm training is required to compensate for the educational deficiencies imposed by the social system. And two, nonwhite hiring at these levels of employment is highly visible, and the firm that undertakes it risks costly reaction from its white employees, government, and the public. The evidence we found of quite mixed results should not surprise us.[58]

The fact that so many U.S. firms with operations in South Africa were willing to adopt the Sullivan Principles and were reluctant in the late 1970s and early 1980s to leave South Africa is also consistent with the hypothesis that there were gains as well as losses from this adoption. Certainly, the evidence on share prices offers no support for the idea that implementing the Sullivan Principles was, on net, costly to the signers. Kaempfer et al. (1987) find no significant declines in the share prices of those firms that signed the Principles compared to those that did not or between those with high Arthur D. Little ratings compared to those with low ratings.[59]

---

58. In fairness to the firms involved, it should also be remembered that all the data on management change came from one twelve-month period, 1977-1978, when the Sullivan Principles had barely begun.

59. In fact, the share prices of non-signatories rose by less (at the 1% level of significance) than the share prices of signatories (Kaempfer et al., 1987, pp. 462ff). Their sample consisted of 105 "South-Africa-active" companies, 95 of them signers of the Sullivan Principles and ten non-signatories.

The final verdict on the ability of private pressure to implement social change, as exemplified by the era of the Sullivan Principles, cannot be reached until the full sample of the Arthur D. Little surveys is evaluated.[60] The partial evidence offered here suggests, not surprisingly, two things. First, such pressure yields positive results when it helps the firms to feel forced to do what it is already profitable to do -- i.e. hire more nonwhites in jobs they are currently capable of doing and will do at lower wages than white workers. But second, the results are less clear when firms are urged to do the unprofitable -- i.e. unilaterally raise nonwhite wage rates or undertake extensive programs to upgrade nonwhite workers into higher-level jobs.

---

60. The confidentiality of the submissions precludes, according to D. Reid Weedon Jr., Senior Vice President of Arthur D. Little, even the large-sample averaging that would be required to replicate the work of this paper.

REFERENCES

R. Alm and J. Jones, "Fighting Apartheid American Style", U.S. News and World Report, 20 Oct. 1986.

Central Statistical Service, Republic of South Africa, South African Statistics, 1986, Pretoria, 1986.

"Fleeing South Africa Is Not the Answer", Business Week, 11 Feb. 1985.

U.S. General Accounting Office (GAO), South Africa -- Summary Report on Trade, Lending, Investment, and Strategic Minerals, GAO/NSIAD-88-228, Washington, September 1988.

Investor Responsibility Research Center (IRRC), News for Investors, monthly newsletter of the IRRC, Washington, various issues.

Investor Responsibility Research Center (IRRC), South Africa Review Service, monthly newsletter of the IRRC, Washington, various issues.

M. Iyengar and R. C. Porter, "South Africa without Apartheid: Estimates from General Equilibrium Simulations", Univ. of Michigan, Center for Research on Economic Development Discussion Paper, May 1989.

E. J. Kahn Jr., "Annals of International Trade (South Africa)", The New Yorker, 14 May 1979.

W. H. Kaempfer, J. A. Lehman, and A. D. Lowenberg, "Divestment, Investment Sanctions, and Disinvestment: An Evaluation of Anti-Apartheid Policy Instruments", International Organization, Summer 1987.

Arthur D. Little Inc., Report on the Signatory Companies to the Statement of Principles for South Africa, Cambridge, various years.

New York Times (abbreviated in the text to NYT), various issues.

R. C. Porter, "Apartheid, the Job Ladder, and the Evolutionary Hypothesis: Empirical Evidence from South African Manufacturing, 1960-1977", Economic Development and Cultural Change, Oct. 1984.

S. P. Sherman, "Scoring Corporate Conduct in South Africa", Fortune, July 1984.

L. Waldorf, "Editorial", New Republic, 7 Sept. 1987.

APPENDIX A: Companies That Subscribed to the Sullivan Principles

Table A1 below provides summary information about all the companies that were Sullivan Principle signatories at some time between 1977 and 1986. This information comes from a series of annual reports (Little, various years) compiled by Arthur D. Little Inc., the official evaluator of the performances of the Sullivan subscriber firms.

The table summarizes three pieces of information: a complete list of signatories of the Sullivan Principles, the year of the first Arthur D. Little Report in which they appear as signatories, and the "grades" that were assigned each year to each of the companies as a measure of their progress.

The first column of the table gives the names of all companies that were Sullivan signatories. Although companies provided information separately for each division or subsidiary in their reports to Arthur D. Little (and to the IRRC), Arthur D. Little only reported information for the company as a whole. Division names are therefore not reported separately in this table.

The second column of the table gives the date of the first report in which each of the companies appeared as signatories. In many cases these dates were the closest we could come to determining when the companies actually signed the Sullivan Principles. For many of the companies in our sample, we were able to get more accurate signing dates from various newspaper articles.

The rest of the table summarizes the grades that the companies received from Arthur D. Little. There is a key at the end of the table explaining what the different grades mean over the years. In general the three grades which are the most relevant for the companies reporting in any period were, "making good progress", "making progress", and "needs to become more active".

Two sets of grades were reported in 1979: 1979a and 1979b. Initially, semiannual progress reports were issued, but by 1980 it was decided to release only annual reports. The report for 1979a was for the period ending 31 March 1979, and for 1979b it was for the period ending 15 October 1979. The reports for 1980-1986 were issued in October or November of each year.

In the places in the table where more than one grade is reported for a company in any one year, this means that different divisions or subsidiaries of that company received different grades. The reports, however, do not specify which subsidiary or division received which grade.

In some cases companies either withdrew from the Sullivan Principles, left South Africa, or were dropped by Arthur D. Little for non-reporting or for non-payment. These are noted in the table by the letters W, L, or D, respectively, under the year in which they occurred. Sometimes these companies still received a grade during that year -- if so, it is reported. In cases where grades appear after a company has withdrawn, this means that they rejoined the program during the year in which the first grade after withdrawal appears.

During the period some companies were involved in mergers and some underwent name changes. These are denoted in the table by *number* under the

year when they occurred, and the action is described in the notes at the end of the table.

Finally, some companies joined very late, and some never received grades (without explanation in the reports). These companies are listed in the table with blanks throughout the grading columns.

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
ABBOTT LABORATORIES	6/30/78	1	2	2	2	2	2	2A	2A	1
AFIA WORLDWIDE INSURANCE	6/30/78	2	3	3	3A	3A	3A	*1*		
AIRPRODUCTS AND CHEMICALS INC	10/25/85									
ALEXANDER & ALEXANDER SERVICES INC	10/25/85									NR(5)
ALLEGHENY INTERNATIONAL INC	10/25/85									
ALLIED-SIGNAL INC	11/12/86									
ALLIS CHALMERS CORP	11/12/86									
AMDAHL CORP	10/25/85									2A
AMERICAN AIRLINES	10/8/80			4,5	4B	4B	W			4
AMERICAN BRANDS INC	10/25/85									
AMERICAN CAN CO	10/8/80				3A	2	3A	2A	2A	2A
AMERICAN CYANAMID COMPANY	6/30/78	1	2	1,4	1,4	1,6	1,4	1,4	1,2B	2A,2B
AMERICAN EXPRESS COMPANY	3/31/79	1	2	3	2	4B	4B	4	4	4
AMERICAN HOME PRODUCTS CORP	3/31/79	1	2	2,3	W			2A	1,2A	1
AMERICAN HOSPITAL SUPPLY CORP	6/30/78	1	2	2	2	2	2	W		
AMERICAN INTERNATIONAL GROUP	10/15/79		SFR	2	3B	3B	3B	3A	2A	2A
AMERICAN STANDARD INC	10/25/85									
ARMCO INC	6/30/78	1	2	1	3A,3B,4B	2,4B	2,4B			L
ASHLAND OIL, INC	10/8/80					5	3A,4A,6			L
AUTOMATED BUILDING COMPONENTS,INC	3/31/79	5	SFR	6			W			
AVERY INTERNATIONAL INC	10/25/85									
AVIS RENT-A-CAR SYSTEM	6/30/78	*2*								
BADGER CO INC	10/15/79		5	*3*						
BAKER INTERNATIONAL	11/12/86									2A
BALTIMORE AIRCOIL CO	10/25/85								2A	2A
BANDAG INC	11/12/86									
BAUSCH AND LOMB INC	10/25/84									1
BAXTER TRAVENOL LABORATORIES INC	10/25/84									L
BECHTEL GROUP INC	10/25/85									
BECOR WESTERN INC	10/25/85									3A
BELL AND HOWELL CO	10/25/85									L
BENDIX CORP	6/30/78	L,1								
BLACK & DECKER MFG CO	10/8/80			5	4	3B	W			
BORDEN INC	6/30/78	1	2	1	1	1	1	1	1	1
BORG-WARNER CORP	3/31/79	5	SFR	3	3B	3A	2	2A	3A	2A
BRISTOL-MYERS CO	3/31/79	5	SFR	2	2	2	2	2A	2A	1
BUNDY CORP	3/31/79	6	6	6	6	6	W			
BURROUGHS CORP	6/30/78	1	2	1	1	1	1	1	1	1
BUTTERICK FASHION MARKETING CO	3/31/79	2	3	3	*4*					
CALTEX PETROLEUM CORP	6/30/78	1	1	1	1	1	1	1	2A	2A
CARBORUNDUM CORP	6/30/78	*5*								
CARNATION CO	3/31/79	2	3	3	3B	3B	3B	3B	2A	L
CARRIER CORP	10/25/83						5	3A	3A	2A
JI CASE	10/25/83						3A,4A	2A	3A	
CATERPILLAR TRACTOR CORP	6/30/78	1	2	1	1	1	2	2A	2A	2A
CBS INC	10/8/80			5	3A	2	3A	2B	2A	L
CELANESE CORP	3/31/79	5	SFR	3	6	3B	3A	2A	1	L
CHAMPION SPARK PLUG CO	3/31/79	2	2	6	6	6	W			
CHASE MANHATTAN BANK N.A.	6/30/78	1	1	2	2	2	2	2B	2B	2B

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
CHEESEBOROUGH-PONDS INC	10/25/85									
CHICAGO BRIDGE AND IRON CO	10/25/83						5	5	D	
CIGNA CORP	11/1/82					1	2	2A	2A	2A
CITIBANK N.A.	6/30/78	1	1	1	1	1	1,4C			
CLARK EQUIPMENT	10/8/81					4A	W			
COCA COLA CO	10/8/80			5	1,2,3B	1,3B	1,2	1,2A	2A	1,2B
COLGATE-PALMOLIVE CO	6/30/78	1	1,2	1,2,3	1	1,2	1	1	1,2A	1
COMBUSTION ENGINEERING INC	10/25/85									2A
CONTROL DATA CORP	6/30/78	1	1	1	1	2	1	1	1	1
COOPER INDUSTRIES	10/8/81				5	3A	2	3A	2A	L
COULTER ELECTRONICS INC	10/25/85									
CPC INTERNATIONAL	6/30/78	1	2	1	2	2	2,4A	2A	2A	3A
CROWN CORK AND SEAL CO INC	3/31/79	NA	6	6	6	6	W			
CUTLER-HAMMER INC	3/31/79	5	6	*6*						
DART INDUSTRIES INC (& KRAFT)	3/31/79	2	2	3	3A	6	6	3	2A	1
DEERE AND CO	6/30/78	1	1	1	1	1	2,4A	2A	2A	2A
DEL MONTE CORP	6/30/78	#	2	*7*			2			
DELOITTE, HASKINS AND SELLS	3/31/79	2	2	3	4C	4C	4C	4	4	4
DINERS CLUB (SA)(PTY) LTD	11/12/86									
DOMINION TEXTILE INC	11/1/82					5	6	7	3B	
DONALDSON CO	6/30/78	1	2	2	1	2	3A	3A	3A	3A
DOW CHEMICAL INC	10/15/79		5	2	2	2	2,4B	2A	2A	2A
DOW CORNING CORP	10/25/84								2B	2B
DRESSER INDUSTRIES INC	10/25/84								2A	2A
DUKANE CORP	10/25/84								5	L
DUN AND BROADSTREET CORP	11/12/86									
D'ARCY MCMANUS&MASIUS WORLDWIDE INC	10/8/81					5	3B	3C	D	
EASTMAN KODAK CO	6/30/78	1	1	1	1	1	1	1	1	2A
EATON CORP	10/25/84							5	3A,3B	L
ELI LILLY AND CO	6/30/78	1	2	2	1,2	2,3A	1,2,4A		1,2A	1,2A
EMERY AIR FREIGHT CORP	10/25/85									
EMHART CORP	10/25/85									
ENGLEHARD MINERALS AN CHEMICALS CORP	6/30/78	#	IR	6	6	5	6	4	4	4
ENVIROTECH CORP	6/30/78	1	1	1,2	1	3A,6	W			
ESB RAY-O-VAC MANAGEMENT CORP	6/30/78	2	2							
ESTEE LAUDER INC	11/12/86									
EXXON CORP	6/30/78	1	1	1,2	1,4B	1	1	1	1,2A	1
FEDERAL-MOGUL CORP	6/30/78	1	3	2	3A	6	3A	2A,3	2A	3A
FERRO CORP	6/30/78	2	3	2	2	3A	3A	3A	3A	3A
FIRESTONE TIRE AND RUBBER CO	6/30/78	1	2	2	3B	3B	3B,4A	2B	2B	2B
JOHN FLUKE MANUFACTURING CO INC	3/31/79		5	6	3B	3A	3A	3A	2A	L
FLUOR INC	3/31/79		5	3	3A,3B	3B	2	1	1	1
FMC CORP	3/31/79	NA	2	3	6	6	6	3A	1	1
FOOTE CONE & BELDING COMMUNICATIONS	10/25/85									
FORD MOTOR CO	6/30/78	1	1	1	1	1	1	2A		2A
FOSTER WHEELER CORP	10/25/84								3A	3A
FRANKLIN ELECTRIC CO INC	6/30/78	1	1	2	3A	3A	6	3	2A	2A
FRUEHAUF CORP	11/12/86									
GAF CORP	3/31/79		5	4	4B	4B	W			

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
GANG NAIL SYSTEMS INC	10/8/81				3B	6				
GARDNER DENVER CO	3/31/79	6	6	*8*						
GATES RUBBER CO	3/31/79		5	6	6	6	W			
GATX CORP	10/25/85									
GELCO CTI CONTAINER CORP	10/25/85									
GENERAL ELECTRIC	6/30/78	NA	2	1,6	2	2,6	2,6	2A,2B	2A,2B	L
GENERAL MOTORS CORP	6/30/78	1	2	1,2	1	1	1	1	1	1
GENERAL SIGNAL CORP	10/25/85									L
GENERAL TIRE AND RUBBER CO	10/8/80			4,5	4A	4A	W			
GILLETTE CO	6/30/78	1	2	1	1	1	1	2A	1	2A
GOODYEAR TIRE AND RUBBER CO	6/30/78	1	2	1	2	1	2	1	2A	3A
WR GRACE AND CO	3/31/79	2	2	1	2	2	3A	2A	2A	2A
GREY ADVERTISING INC	11/12/86									
GROLIER INC	3/31/79		5	6	6	6	W			
GTE CORP	10/25/85								5	L
FRANK B HALL AND CO INC	11/12/86									
HARNISCHFEGER CORP	10/25/85									
HARPER GROUP	10/25/85									
WALTER E. HELLER OVERSEAS CORP	3/31/79	NA	4	4	4A,4C	4C	4C	4D		L
HEUBLEIN INC	3/31/79	1	2	2	2	2	2	2A		
HEWLETT-PACKARD CO	6/30/78	1	1	1	1	1	2	1	1	2A
HONEYWELL INC	6/30/78	1	2	3	2	2	2	2A	1	1
HOOVER CORP	10/15/79	NA	2	2	2	3A	3A	3A	3A	3A
HYSTER CO	10/15/79		5	6	6	2	2	L		
IBM CORP	6/30/78	1	1	1	1	1	1	1	1	1
IMS INTERNATIONAL INC	11/12/86									
INA CORP	6/30/78	1	2	2	3A					
INCO ELECTROENERGY CORP	10/8/80			3	L					
INGERSOLL-RAND	10/25/85									3A
INMONT CORP	6/30/78									
INTERGRAPH CORP	10/25/85									2B
INTERNATIONAL HARVESTER CO	6/30/78	1	3	1,2	2,3B	6	3A,3B	3A	L	
INTERNATIONAL PLAYTEX INC	10/25/85									
INTERNTNL CORR SCHOOLS INC	10/25/85									3A
INTERNTNL FLAVORS & FRAGRANCES INC	11/12/86									
INTERNTNL MINERALS & CHEMICALS CORP	6/30/78		3	2	3B	2	3A	2A	2A	2A
INTERNTNL TELEPHONE & TELEGRAPH	6/30/78	NA	6	2,3	3A	1,3B,6	1,4C,6	1A,2B	2A,2B	2A,NR(16
INTERPUBLIC GROUP OF COS INC	6/30/78	1	3	3	3A	3A,3B	6	3A,3B	3A,3B	2A
SC JOHNSON & SON INC	10/25/85									
JOHNSON CONTROLS INC	10/15/79			3	3B	6	6	3	3A	3A
JOHNSON & JOHNSON CO	6/30/78	1	2	1	1	1,2	1	1,2A	1,2A	1,2A
JOY MANUFACTURING CO	3/31/79	6		6	6	6	6	3	2A	3A
KELLOGG CO	6/30/78	1	2	1	1	1	2	2A	1	1
KELLY-SPRINGFIELD TIRE CO	3/31/79	*10*								
KENNAMETAL INC	11/12/86									
KENNECOTT COPPER CORP	6/30/78	1,2	2	2,3	2					
KIMBERLY-CLARK CORP	10/25/85									
LECO CORP	10/25/85									
LOCTITE CORP	10/8/80			5	3B	3B	W			1

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
MACMILLAN INC	10/25/85								5	L
MARRIOTT CORP	10/8/81					5	3A	3A	2A	L
MARSH AND MCLENNAN COS	11/1/82						6		2B	NR(33)
MARTIN MARIETTA CORP	10/25/85									
MASONITE CORP	6/30/78	1	2	3	6	6	3B	2A,3B	2A	2A
MCGRAW-HILL INC	6/30/78	1	2	1	2	1	1	1	1	1
MEASUREX	3/31/79	5	SFR	2	3A	3A	6	3C	W	
MEDTRONIC INC	10/25/85									
MERCK & CO INC	6/30/78	1	1,2	1,2	1,2	1	1,2	1,2A	2A	1
MIDLAND ROSS CORP	10/25/85								3A	
MILIPORE CORP	10/25/85								5	L
MINE SAFETY APPLIANCES CO	10/15/79		5	3	3B	3B	3B	3A	3A	3A
3M SOUTH AFRICA (PTY) LTD	6/30/78	1	1	2,6	1,3A	1,3A	1	1	1	1
MOBIL OIL CORP	6/30/78	1	1	1	1	1	1	1	1	2A
MOLEX INTERNATIONAL INC	11/12/86									
MONSANTO CO	6/30/78	2	2	2	3A	1	1	2A	1,3A	1
JP MORGAN AND CO INC	10/25/85									
MOTOROLA INC	3/31/79	*	2	3	3A	3A	3A	3A	2A	L
NABISCO INC	6/30/78	4	4	4	4A	3B	2	2A		
NALCO CHEMICAL CO	6/30/78	NA	2	3	3B	3B	3B	3A	3A	2A
NASHUA CORP	3/31/79	NA	SFR	3	3A	6	W			
NCR CORP	6/30/78	1	1	2	2	3A	3A	3A		2A
NEWMONT MINING CORP	11/12/86									
AC NIELSON INTERNATIONAL INC	3/31/79	NA	2	3	3A	3A	W			
NORTH CAROLINA NATIONAL BANK	10/15/79		5	6	4B	4B	4B	4	2B	2B
NORTON CO	3/31/79	5	6	6	3B	2,3A, 3B,4B	2,3A,4B	1	1	1
NORTON SIMON INC	6/30/78	1	1	3	1,6	4A	4A	W		
OGILVY GROUPS INC	10/25/85									3A
OLIN CORP	3/31/79	1	2	2,6	2,6	2,6	3A,3B,6	1,2B,3	1,2B	1
OTIS ELEVATOR (UNITED TECH)	6/30/78	1	2	2	2	2,6	2	2A	2A	2A
OWENS-ILLINIOS INC	10/25/85									
PACKARD INSTRUMENT (PTY) LTD	10/25/84							5		L
PAN AMERICAN WORLD AIRWAYS INC	3/31/79	5	IR	4	4B	4B	W			
PARKER HANNIFAN CORP	11/12/86									
PARKER PEN CO	6/30/78	NA	2	2	3B	2	2	2A	2A	L
PENNWALT CORP	10/15/79		5	6	4B	4B	W			L
PEPSICO INC	10/25/84									
PFIZER INC	6/30/78	1	2	1,2	1,3B	1,2	1,2	1	1	1
PHELPS DODGE CORP	6/30/78	1	6	1	3B,6	2,6	3A,6	2A,3	3A	2A,NR(44
PHIBRO CORP	10/8/81				5	6	W			
PHILLIPS PETROLEUM CORP	6/30/78	2	2	2	2	2	2	1	2A	4
PIZZA INN INC	11/12/86									
RANK XEROX LTD	6/30/78	1	2	1	1	2	1	1	1	1
RAYCHEM CORP	11/12/86									
RAYTHEON	10/8/80			4	4B	4B	W			
READERS DIGEST ASSOC INC	3/31/79	1	2	3	3B	3A	3A,4A	3A	2A	2A
REVLON INC	3/31/79	5	6	6	6	6	W			
REXNORD INC	6/30/78	1	2	2	2	3A	3A	2A	2A	2A

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
REYNOLDS AND REYNOLDS CO	11/12/86									
RJ REYNOLDS IND INC	10/8/80			2	2	1	2	1,2A	1,2A	1,2A
RICHARDSON-MERRELL INC	3/31/79	#	2	3	3	3A	3A	2A	2A	1
ROBBINS CO	11/12/86									
HH ROBERTSON	11/12/86									
AH ROBINS CO INC	10/8/81					5	W			L
ROCKWELL INTERNATIONAL	6/30/78	4	4	4	4A	W,4A				
ROHM AND HAAS	6/30/78	1	2	2	2	2	3A,4B	2A,4B	2A,4	L
SARA LEE CORP	10/25/85									
SCHERING-PLOUGH CORP	6/30/78	1	1	1,2	1,3A	2	2	2A	2A	2A
JOSEPH E SEAGRAMS & SONS INC	10/25/85									
GD SEARLE AND CO	10/25/85								5	*9*
SENTRY INSURANCE MUTUAL CO	10/15/79		SFR	1	1	2	3A	3A	W	
SIGMAFORM CORP	11/12/86									
SIMPLICITY PATTERN CO INC	3/31/79	2	2	3	3A	6	W			D
SINGER CO	6/30/78	1	2	6	6	6	W			L
SKOK SYSTEMS INC	10/25/85									2A
SMITH-KLINE CORP	3/31/79		2	1	2	1	2,5	2A	1,2A	1,2A
SOUTHERN NEW ENGLAND TELEPHONE	11/12/86									
SPERRY-RAND CORP	6/30/78	1	1	1	1	1	1	1	1	2A
SQUARE D CO	10/25/85									
SQUIBB CORP	3/31/79	1	2	2,3,6	2,3B	2	3A	3A	2A	1
STANDARD BRANDS INC	10/15/79		5	2	3A	*11*				
STANFORD LANE GROUP	11/12/86									
STANLEY WORKS	10/8/81					5	2	W		L
STERLING DRUG INC	6/30/78	1	2	2	1	2	3A	2A	2A	2A
STONE & WEBSTER ENG SERVICES	10/25/85									
SUN CHEMICAL CORP	11/12/86									
TAMPAX INC	6/30/78	2	3	3	1	2	1			
TENNECO INC	11/1/82					5	3A,4A	2A	3A	2A
J WALTER THOMPSON CO	10/15/79		5	6	6	6	6	W		
TIME INC	10/8/81				4B,5	4B	4B	4	2B	2B
TOKHEIM CORP	10/15/79		5	6	6	3B	W			2A
TRANE CO	6/30/78	2	2	2	3B	3B	3B	4D	D	
TRANS WORLD AIRLINES	10/25/84									
TRANS WORLD CORP	10/8/81				4B,5	4B		W		L
TRW	3/31/79	5	2	4	4A	4A	W			
TWIN DISK CO	6/30/78	#		4	4B	4B	W			
UNION CAMP CORP	11/12/86									
UNION CARBIDE CORP	6/30/78	1	1,2	1,2,3	1	1,2,4B	1,2,4B	1,2A	1,2A,2B	1,2A
UNIROYAL INC	6/30/78	1	2	2	3A	6	W			
UNITED STATES LINES INC	11/12/86									
UPJOHN INTERNATIONAL	6/30/78	1	2	2	2	1,3A	2,3A	2A	2A	2A
USX CORP	11/12/86									
VF CORP	10/25/85							5		L
WANG LABORATORIES INC	10/25/85									
WARNER COMMUNICATIONS INC	10/8/80			5	3A,3B	6	1,3A	1,2A	1,2A	2A
WARNER LAMBERT	6/30/78	1	2	1,3	2	2	1,3A	2A,2B	2A,2B	2A
WASHINGTON TIMES	10/25/85								5	D

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

NAME OF COMPANY	FIRST REPORT	GRADES RECEIVED IN A. D. LITTLE REPORT								
		1979a	1979b	1980	1981	1982	1983	1984	1985	1986
WESTIN HOTEL CO	10/25/84							5	D	
WESTINGHOUSE ELECTRIC CORP	6/30/78	1	2	3	3B	2	1	2A	2B	2B
WHITE MOTOR CORP	6/30/78	4	4							
WILBUR-ELLIS CO	3/31/79	2	2	2	2	3A	3A	3A	3A	3A
WILSON LEARNING CORP	10/25/85								5	

Notes:

FIRST REPORT means the date of the first report in which the firm appeared as a signatory.

All words below in quotation marks are those used in the A. D. Little reports.

1979a: 1 = "Making acceptable progress"
2 = "Cooperating"
4 = "Endorser" (no employees)
5 = New signatory
6 = Did not report
NA = Report received too late for analysis
# = Did not report for some (unspecified) reason

1979b: Same as above except:
1 = "Making good progress"
2 = "Making acceptable progress"
3 = "Needs to become more active"
IR = "Inadequate report"
SFR = "Submitting first report"

1980: Same as above

1981: Same as above except:
2 = "Making progress"
3A = "Received low point rating"
3B = "Did not pass basics"
4A = "Endorser" (no employees)
4B = "Endorser" (10 or fewer employees)
4C = "Endorser" (holds less than 19% equity in South African operation)

1982, 1983: Same as above

1984, 1985, 1986: Same as above except:
2A = Based on full report
2B = Based on short-form report
NR() = Non-reporting minority owner (percentage of ownership)

W = Withdrew from Sullivan Principles
L = Left South Africa
D = Dropped (by A. D. Little) for either non-payment or non-reporting

TABLE A1

COMPANIES WHO ACCEDED TO THE SULLIVAN PRINCIPLES

Notes (continued):

1 = Merged with Cigna
2 = Now listed under Norton Simon
3 = Now listed under Raytheon
4 = Now listed under American Can
5 = Now listed under Kennecott Copper
6 = Acquired by Eaton Co
7 = Now listed under RJ Reynolds
8 = Acquired by Cooper Ind
9 = Acquired by Monsanto
10 = Now listed under Goodyear
11 = Acquired by Nabisco

APPENDIX B: Data Sources and Procedures

The Investor Responsibility Research Center (IRRC) publishes South Africa Review Service, which deals with investment issues relating to South Africa. The wage and labor data used in this paper came from a number of reports contained in that series. Some U.S. companies that were signatories to the Sullivan Principles agreed to provide the IRRC with information similar to that reported to Arthur D. Little. This information, unlike that provided to Arthur D. Little, was not released under condition of confidentiality. The wage and labor data that we used came from company reports and updates provided by these companies.[61]

The companies provided information on many aspects of the Sullivan Principles for the period from the early 1970s to the middle 1980s. Our interest was in the data pertaining to wages and employment. The data were reported in vastly different ways: For different years; with different job classifications; some provided wage data, others did not; and the form of the wage data differed.

In order to utilize the labor data (in Section III), the reported data had to meet certain criteria. First of all, to measure changes over time, we needed at least two years of data. Second, firms reported labor figures for their own particular job classifications, and these had to be the same for any pair of years.[62] For many companies, we were able to find more than one pair of years with the same job grades; and for some companies, the job classifications were not identical but were similar enough that a slight regrouping of the data was all that was necessary to make two years comparable.[63]

Preparation of the data for the wage calculations (in Section IV) proved more difficult. Company reporting of wages was less uniform than the reporting of employment. Wage data were reported to IRRC in two ways. One set of companies reported average wages for each job grade and for each of the racial groupings (i.e. black, Asian, colored, and white). The weighted average for the first three groups (i.e. black, Asian, and colored) was calculated, so that we ended up with average wage rate for two groups, "non-whites" and "whites", for each job grade.

The other set of companies reported, for each job grade, the following data: the minimum wage for the job grade (Y_{min}), the maximum wage for the job grade (Y_{max}), the average wage rate (of all races) for the job grade (Y_{ave}), and the fraction for each racial group of the labor in that job grade earning

---

61. A list of the companies is provided in Tables B1, B2, and B4.

62. The classifications changed over time for almost all of the companies for which IRRC reported data.

63. For example, if the employment data for two categories, such as "manager" and "supervisor", were given separately in one year and combined in the other of two nearby years, we would use the combined classification for the comparison of the years.

more than that average wage rate. Since roughly half of the companies in our wage sample provided their wage data in this form, we decided on a procedure to translate this information into estimates of the average wage rates of "non-whites" and "whites". By assuming a three-tiered uniform distribution for each race, we were able to use the information mentioned above to estimate average "non-white" and "white" wages for this subset of companies.[64]

Tables B1 and B2 list the companies that comprised the two samples we used to study labor and wage changes of non-whites; and Table B4 lists the companies used in the section on management and supervisory jobs. The tables provide the following information: the names of the companies in the sample (the divisions or subsidiaries are specified if they were reported separately), and the pair or pairs of years for which we found usable data for each company.[65]

The employment and wage data for all South African manufacturing (used in Section V) are given in Table B3.

---

64. By three-tiered uniform distribution, we mean a constant frequency from Y_{min} to $Y_{min} + Y_{max} - Y_{ave}$, a different constant frequency from there to Y_{ave}, and a still different constant frequency from there to Y_{max}. (Y_{ave} was always nearer Y_{max} than Y_{min}.) There are three parameters to such a distribution. That the cumulative distribution must reach one at the maximum wage determines one parameter. The known fraction of the labor above the average wage determines a second. We assumed the third parameter for each race to be as near equal to that of the other race as is consistent with positive values for all the parameters, and then the fact that the known overall average wage must equal the weighted average wage of the two races determines that third parameter. With these estimates of the three parameters, we could then estimate the average wage by race within the job category. This arbitrary procedure was checked against, and always was consistent with, common sense.

65. The decimal part of the year date indicates the month and day of the data reported. E.g. 1977.00 refers to 1 January 1977 (or 31 December 1976); 1977.33 refers to 30 April 1977 (or 1 May 1977).

Table B1

Firms in the Labor Sample (Section III)

Company	Year Pairs
Bendix-Fram, Filters Division	1977.00-1978.00
Bendix-Fram, Filters Division	1978.00-1978.50
Borg Warner, Axle Division	1972.00-1976.00
Borg Warner, Axle Division	1976.00-1978.00
Borg Warner	1980.58-1984.58
Borg Warner, Parts Division	1976.00-1978.00
Caltex	1979.58-1980.50
Caltex	1980.50-1983.00
J. I. Case	1973.50-1976.50
Citicorp	1980.58-1983.58
CPC International	1979.50-1980.58
CPC International	1980.58-1984.58
Control Data	1977.00-1978.00
Control Data	1978.00-1978.92
Control Data	1979.50-1980.50
Control Data	1980.50-1983.75
Exxon, Chemical Divison	1973.00-1976.00
Exxon, Chemical Division	1976.00-1977.00
Exxon, Chemical Division	1977.00-1978.00
Exxon, Esso Standard & Chemical Division	1979.58-1983.67
Exxon, Gilbarco Division	1973.00-1976.00
Exxon, Gilbarco Division	1976.00-1977.00
Exxon, Gilbarco Division	1977.00-1978.00
Exxon, Gilbarco Division	1978.00-1979.00
Exxon, Gilbarco Division	1979.58-1983.67
Exxon, Esso Standard Depot	1978.00-1978.50
Exxon, Esso Standard Head Office	1976.00-1978.00
Exxon, Esso Standard Head Office	1978.00-1978.50
Exxon, Esso Standard Division	1973.00-1976.00
Exxon, Esso Standard Division	1976.00-1977.00
Exxon, Esso Standard Division	1977.00-1978.00
Exxon, Esso Standard Division	1979.58-1983.67
Ford Motor	1978.00-1979.50
Ford Motor	1980.50-1983.50
General Electric	1979.50-1980.50
General Electric	1980.50-1983.50
General Motors	1980.08-1983.58
Gillette	1974.00-1977.00
Gillette	1977.00-1978.00
Gillette	1978.00-1978.50
Gillette	1979.00-1979.50
Gillette	1979.50-1980.50
Goodyear	1980.58-1983.58
Hewlett-Packard	1978.00-1978.50
Hewlett-Packard	1981.50-1983.50
Honeywell	1977.00-1978.00
Honeywell	1978.00-1978.50

IBM	1976.00-1978.50
IBM	1978.50-1980.50
ITT, Teves Subsidiary	1980.58-1983.58
ITT	1979.58-1980.58
Johnson & Johnson, Ethnor Division	1980.58-1983.58
Johnson & Johnson	1980.58-1983.58
Eastman Kodak	1979.75-1981.00
Eastman Kodak	1981.00-1983.58
Masonite, Durban Division	1973.00-1977.00
Masonite, Durban Division	1977.00-1978.00
Masonite, Durban Division	1978.00-1978.50
Masonite, Estcourt Division	1977.00-1978.00
Masonite, Estcourt Division	1978.00-1978.50
Masonite, Estcourt Division	1978.50-1979.50
Masonite, Forestry Division	1973.00-1977.00
Masonite, Forestry Division	1977.00-1979.50
Merck	1980.00-1983.00
Minnesota Mining and Manufacturing (3M)	1975.50-1979.50
Minnesota Mining and Manufacturing (3M)	1979.50-1980.50
Minnesota Mining and Manufacturing (3M)	1980.50-1983.50
Mobil	1979.50-1981.25
Mobil	1981.25-1984.25
Mobil	1980.58-1983.58
Phillips Petroleum	1973.00-1977.00
Phillips Petroleum	1977.00-1978.00
Phillips Petroleum	1978.00-1978.50
Phillips Petroleum	1978.50-1979.50
United Technologies (Otis)	1979.58-1980.58
United Technologies (Otis)	1980.58-1984.58
Xerox	1977.00-1979.00
Xerox	1981.58-1983.58

Note: Where no division is given, the data refer to the company's entire South African operations.

Table B2

Firms in the Wage Sample (Section IV)

Company	Year Pairs
Borg Warner, Axle Division	1972.00-1976.00
Borg Warner, Axle Division	1976.00-1978.00
Borg Warner, Parts Division	1976.00-1978.00
J. I. Case	1973.50-1976.50
Caltex	1979.00-1980.50
Caltex	1980.50-1983.00
Colgate Palmolive	1979.50-1980.33
Deere	1980.50-1984.50
Ford Motor	1979.50-1983.63
ITT	1979.50-1980.50
Kellogg	1979.50-1980.50
Kellogg	1980.50-1981.05
Minnesota Mining and Manufacturing (3M)	1975.50-1979.50
Minnesota Mining and Manufacturing (3M)	1979.50-1980.50
Minnesota Mining and Manufacturing (3M)	1980.50-1983.50
Mobil	1981.25-1984.25
United Technologies (Otis)	1977.05-1979.00
United Technologies (Otis)	1979.00-1979.50

Note: See note for Table B1.

TABLE B3

South African Manufacturing, 1972-1985 -- Employment and Wages by Race

Year	Employment				Salaries and Wages (R1000)			Average Wage			
	Whites	Nonwhites	Growth Lw	Growth Ln	Whites	Nonwhites	Total	Whites	Nonwhites	Growth Yw	Growth Yn
1972	258061	869214	--	--	1111378	731801	1843179	4.307	0.842	--	--
1973	266300	922700	3.19%	6.15%	1245760	906863	2152623	4.678	0.983	8.62%	16.74%
1974	272800	987000	2.44%	6.97%	1470517	1157809	2628326	5.390	1.173	15.23%	19.35%
1975	287900	1019700	5.54%	3.31%	1765561	1421417	3186978	6.133	1.394	13.77%	18.83%
1976	300415	1044336	4.35%	2.42%	2055495	1706821	3762316	6.842	1.634	11.57%	17.25%
1976	304584	1050621	--	--	2069058	1711484	3780542	6.793	1.629	--	--
1977	301700	1015500	-0.95%	-3.34%	2256644	1868291	4124935	7.480	1.840	10.11%	12.94%
1978	297300	1014800	-1.46%	-0.07%	2490723	2114195	4604918	8.378	2.083	12.01%	13.24%
1979	300234	1032509	0.99%	1.75%	2903730	2473851	5377581	9.672	2.396	15.44%	15.00%
1980	306500	1085500	2.09%	5.13%	3515961	3111189	6627150	11.471	2.866	18.61%	19.62%
1981	315800	1133200	3.03%	4.39%	4295625	3920213	8215838	13.602	3.459	18.58%	20.70%
1982	320800	1133500	1.58%	0.03%	5061079	4657051	9718130	15.776	4.109	15.98%	18.76%
1983	309400	1063200	-3.55%	-6.20%	5491041	5018411	10509452	17.747	4.720	12.49%	14.88%
1984	307800	1072200	-0.52%	0.85%	6163125	5725740	11888865	20.023	5.340	12.82%	13.14%
1985	302500	1024400	-1.72%	-4.46%	6707047	6145045	12852092	22.172	5.999	10.73%	12.33%
Average Growth Rates			1.15%	1.30%						13.54%	16.37%

Notes:
1. Source: Central, 1986.
2. The coverage of the data changed slightly in 1976. Two figures are given for that year, the upper comparable to the data preceding it, the lower comparable to the data following it.
3. "Growth" refers to the growth rate in that year over the preceding year. The average growth rates at the bottom of the columns are simple averages of the figures above.

Table B4

Firms in the Management and Supervisory Sample (Section VI)

Company	Year Pairs
Bendix-Fram, Filters Division	1977.00-1978.00
Bendix-Fram, Filters Division	1978.00-1978.50
Control Data	1977.00-1978.00
Control Data	1978.00-1978.50
Exxon, Gilbarco Division	1977.00-1978.00
Exxon, Gilbarco Division	1978.00-1978.50
Exxon, Depot	1977.00-1978.00
Exxon, Depot	1978.00-1978.50
Exxon, Esso Standard Head Office	1977.00-1978.00
Exxon, Esso Standard Head Office	1978.00-1978.50
Exxon, Pipeline	1977.00-1978.00
Exxon, Pipeline	1978.00-1978.50
Gillette	1977.00-1978.00
Gillette	1978.00-1978.50
Hewlett-Packard	1977.00-1978.00
Hewlett-Packard	1978.00-1978.50
Honeywell	1977.00-1978.00
Honeywell	1978.00-1978.50
Masonite, Durban Division	1977.00-1978.00
Masonite, Durban Division	1978.00-1978.50
Masonite, Estcourt Division	1977.00-1978.00
Masonite, Estcourt Division	1978.00-1978.50
Phillips Petroleum	1977.00-1978.00
Phillips Petroleum	1978.00-1978.50

Note: See note for Table B1.

The University of Michigan

Center for Research on Economic Development

PUBLICATIONS

February 1991

General Publications Information

The Center for Research on Economic Development (CRED) issues four types of publications:

1. Newsletter. News of CRED activities and alumni, published periodically.
2. Special Publications. Including classroom materials for development courses, administrative manuals, etc.
3. Project Reports. Detailed findings of overseas research studies and reports on conferences both overseas and in the U.S.
4. Discussion Papers. Articles circulated for comments prior to submission to academic journals.

CRED publications may be obtained by writing to:

Publications Coordinator
Center for Research on Economic Development
340 Lorch Hall
611 Tappan Street
Ann Arbor, MI 48109-1220 USA

Fax: 313-764-2769. Telephone: 313-764-9490.

Payment should accompany your order.

Newsletter

CRED publishes a periodic newsletter entitled "CREDits" which is available free of charge. To have your name placed on this mailing list, please write to the Publications Coordinator.

Special Publications

The prices below include bookrate postage and handling charges. Please refer to the Special Publication Number (SP#) when placing an order.

5. Barlow, Robin. Le Modèle IS - LM: Versions Pays-riche et Pays-pauvre. March 1987.

This paper is designed as a teaching tool for French-language courses in the macroeconomics of development. It shows how the IS-LM model conventionally used for high-income countries can be modified to suit the structure of low-income countries. Both algebraic and geometrical versions of the model are used, and suggestions for classroom exercises are included. The paper is an adaptation of an article by Richard Porter and Susan Ranney which appeared in World Development (1982).

4. Knieriemen, Marily. A Manual for Administration of Research and Development Projects. October 1987.

This manual was written during CRED's field research in Burkina Faso. It contains many suggestions for improving the administration of field research projects, particularly in the context of Francophone West Africa.

Ralandia Case Studies. These case studies are designed to promote class discussion on economic policy in developing countries. They are problem-solving cases, self-contained, and will not require any additional data. The set is available in either English (SP No. 2) or French (SP No. 3).

3. La République Démocratique Populaire de Ralandie: Deux Etudes de Cas. Jacqueline R. Sherman et David F. Gordon. November 1986. 68 p. $5.00.

2. The People's Democratic Republic of Ralandia: Two Case Studies. Jacqueline R. Sherman and David F. Gordon. October 1986. 60 p. $5.00.

1. Barlow, Robin (editor). Case Studies in the Demographic Impact of Asian Development Projects. (Contributors: J. Anderson, H. Barnum, J. Bauer, P. Gosling, A. Jain, H. Mohtadi, and E. Mueller.) 1982. 204 p. $10.00.

This collection is also appropriate for use in the classroom.

Project Reports

The prices below include bookrate postage and handling charges. Please refer to the Project Report Number (PR#) when placing an order.

55. Global Economic Reform. 1991. 94 p. $10.00. (Report on the Workshop on Global Economic Reform held in Ann Arbor, Michigan in May 1990).

54. Burundi: La Politique d'Ajustement Structurel. 1990. 320 p. $10.00. (French report on the workshop held in Bujumbura, Burundi in May 1990).

53. Burundi: Structural Adjustment Policy. 1990. 300 p. $10.00. (English report on the workshop held in Bujumbura, Burundi in May 1990).

52. Atelier sur la Réforme Economique en Afrique. 1989. 138 p. $10.00. (French report on the workshop held in Nairobi, Kenya in July 1989).

51. Workshop on Economic Reform in Africa. 1989. 118 p. $10.00. (English report on the workshop held in Nairobi, Kenya in July 1989).

50. La Réforme Economique en Afrique: Leçons des Expériences Actuelles. 1988. 153 p. $10.00. (Report on the workshop held in Abidjan, Côte d'Ivoire in September 1988).

49. Economic Reform in Africa: Lessons from Current Experience. 1988. 132 p. $10.00. (Report on the workshop held in Nairobi, Kenya in September 1988).

48. Saul, Mahir and Green, Ira. La Dynamique de la Commercialisation des Céréales au Burkina Faso, Tome IV: Documents de Travail 5-6. 1987. 290 p. $25.00. (Price for 4-volume French set consisting of PR Nos. 43, 44, 46, & 48 is $90.00 instead of $100.00.)

47. Saul, Mahir and Green, Ira. The Dynamics of Grain Marketing in Burkina Faso, Volume IV: Research Reports 5-6. 1987. 264 p. $25.00. (Price for 4-volume English set consisting of PR Nos. 42, 44 [in French], 45 & 47 is $90.00 instead of $100.00.)

46. McCorkle, Constance M.; May, Charles A.; Szarletta, Ellen Jean; and Pardy, Christopher R. La Dynamique de la Commercialisation des Céréales au Burkina Faso, Tome III: Documents de Travail 1-4. 1987. 400 p. $25.00.

45. McCorkle, Constance M.; May, Charles A.; Szarletta, Ellen Jean; and Pardy, Christopher R. The Dynamics of Grain Marketing in Burkina Faso, Volume III: Research Reports 1-4. 1987. 364 p. $25.00.

44. Dejou, Chantal. La Dynamique de la Commercialisation des Céréales au Burkina Faso, Tome II: Rapports Régionaux. 1987. 768 p. (Part 1 - 412 p.; Part 2 - 356 p.) $45.00. [available only in French.]

43. Sherman, Jacqueline R.; Shapiro, Kenneth H.; and Gilbert, Elon. La Dynamique de la Commercialisation des Céréales au Burkina Faso, Tome I: Analyse Economique de la Commercialisation des Cereales. 1987. 596 p. $30.00.

42. Sherman, Jacqueline R.; Shapiro, Kenneth H.; and Gilbert, Elon. The Dynamics of Grain Marketing in Burkina Faso, Volume I: An Economic Analysis of Grain Marketing. 1987. 576 p. $30.00.

41. Mathes, J.C. and Elon Gilbert. Gestion des ressources en eau et mise en valeur du Bassin du Fleuve Gambie. 1985. 291 p. $20.00.

40. Ames, Peter. Ecologie terrestre et mise en valeur du Bassin du Fleuve Gambie. 1985. 382 p. $20.00.

39. Derman, William et al. Développement rural dans le Bassin du Fleuve Gambie. 1985. 368 p. $20.00.

38. Moll, Russel and Dorr, John. Ecologie aquatique et mise en valeur du Bassin du Fleuve Gambie. 1985. 257 p. $20.00.

37. Schneider, Curt R. Maladies liées à l'eau et mise en valeur du Bassin du Fleuve Gambie. 1985. 368 p. $20.00.

36. Mathes, J.C. and Gilbert, Elon. Water Resource Management and Gambia River Basin Development (Gambia River Basin Studies). 1985. 253 p. $20.00. (Price for 5-volume set consisting of PR Nos. 32-36 is $80.00 instead of $100.00.)

35. Ames, Peter. Terrestrial Ecology and Gambia River Basin Development (Gambia River Basin Studies). 1985. 358 p. $20.00.

34. Derman, William et al. Rural Development in the Gambia River Basin (Gambia River Basin Studies). 1985. 330 p. $20.00.

33. Moll, Russell and Dorr, John. Aquatic Ecology and Gambia River Basin Development (Gambia River Basin Studies). 1985. 244 p. $20.00.

32. Schneider, Curt R. Water-Associated Diseases and Gambia River Basin Development (Gambia River Basin Studies). 1985. 346 p. $20.00.

31. Josserand, Henri et al. Projet Elevage Département de Bakel (Sénégal): Rapport Final d'Evaluation (Partie I, Synthèse; Partie II, Gestion des Pâturages; Partie III, Pédologie et Hydrologie; Partie IV, Etude Socio-économique). 1985. 530 p. $25.00.

30. Josserand, Henri et al. Eastern Senegal Range and Livestock Project: Final Monitoring and Evaluation Report (Part I, Synthesis; Part II, Range Management; Part III, Soils and Water Engineering; Part IV, Socioeconomic Study). 1985. 454 p. $25.00.

29. Sherman, Jacqueline R. Grain Markets and the Marketing Behavior of Farmers: A Case Study of Manga, Upper Volta. 1984. 317 p. $20.00.

28. Shapiro, Kenneth H., et al. Agroforestry in Developing Countries. 1984. 195 p. $12.00.

27. Ariza-Nino, Edgar J., et al. Effets Nutritifs de Politiques Agricoles: Cameroun et Sénégal - Partie I: Rapports de Pays. 1982. 369 p. $8.00. Partie II: Méthodologies d'Analyse et Modalités d'Enquête. 1982. 284 p. $7.00.

26. Ariza-Nino, Edgar J., et al. Consumption Effects of Agricultural Policies: Cameroon and Senegal - Part I: Country Reports; Part II: Methodology. 1982. 465 p. $15.00.

25. See 'Special Publications' section: Case Studies in the Demographic Impact of Asian Development Projects has become Special Publications (SP) No. 1.

24. Makinen, Marty et Ariza-Nino, Edgar J. La Marché Offert au Bétail dans la Zone Nigérienne Centrale (Le Projet de Gestion des Paturages et de l'Elevage). 1982. 63 p. $7.50.

23. Makinen, Marty and Ariza-Nino, Edgar J. The Market for Livestock from the Central Niger Zone (Niger Range and Livestock Project). 1982. 55 p. $7.50.

22. Ariza-Nino, Edgar J. et Griffith, J.L.P. Les Fournisseurs - Argentine, Australie, Nouvelle-Zélande; et Ariza-Nino, Edgar J.; Manly, D.W. et Shapiro, Kenneth H. L'Economie Mondiale de la Viande: Autres Pays - Fournisseurs et Consommateurs (Tome IV/V, La Commercialisation du Bétail et de la Viande en Afrique de l'Ouest). 1981. 476 p. $15.00.

21. Delgado, Christopher L., et Staatz, John M. Côte d'Ivoire et Mali (Tome III, La Commercialisation du Bétail et de la Viande en Afrique de l'Ouest). 1981. 567 p. [Out of Print.]

20. Josserand, Henri P., et Sullivan, Gregory. Bénin, Ghana, Libéria, Togo (Tome II, La Commercialisation du Bétail et de la Viande en Afrique de l'Ouest). 1980. 441 p. $15.00.

19. Ariza-Nino, Edgar J.; Herman, Larry A.; Makinen, Marty; et Steedman, Charles. Rapport de Synthèse; Haute Volta (Tome I, La Commercialisation du Bétail et de la Viande en Afrique de l'Ouest). 1981. 258 p. $15.00.

18. Ariza-Nino, Edgar J.; Manly, D.W.; and Shapiro, Kenneth. The World Meat Economy: Other Supplier and Consumer Countries (Volume V, Livestock and Meat Marketing in West Africa Project). 1980. 183 p. $15.00.

17. Ariza-Nino, Edgar J., and Griffith, J.L.P. Suppliers: Argentina, Australia and New Zealand (Volume IV, Livestock and Meat Marketing in West Africa Project). 1979. 239 p. [Out of Print.]

16. Delgado, Christopher L., and Staatz, John M. Ivory Coast and Mali (Volume III, Livestock and Meat Marketing in West Africa Project). 1980. 439 p. $15.00.

15. Josserand, Henri P. and Sullivan, Gregory. Benin, Ghana, Liberia, Togo (Volume II, Livestock and Meat Marketing in West Africa Project). 1980. 446 p. $15.00.

14. Ariza-Nino, Edgar J.; Herman, Larry A.; Makinen, Marty; & Steedman, Charles. Synthesis: Upper Volta (Volume I, Livestock and Meat Marketing in West Africa Project). 1980. 204 p. $15.00.

13. Eddy, Edward D. L'Utilisation de la Terre et de la Main d'Oeuvre à l'Interieur des Exploitations Agricoles Intégrées de la Zone Pastorale Nigérienne (Monographie III, La Production et la Commercialisation du Bétail dans les Pays du Conseil de l'Entente). 1980. 406 p. [Out of Print.]

12. Staatz, John M. L'Economique de la Commercialisation du Bétail et la Viande en Côte d'Ivoire (Monographie II, La Production et la Commercialisation du Bétail dans les Pays du Conseil de l'Entente). 1980. 536 p. $15.00.

11. Delgado, Christopher K. L'Elevage par Rapport à l'Agriculture au Sud-Est de la Haute-Volta: Analyse de l'Allocation des Ressources au Niveau de l'Exploitation (Monographie I, La Production et la Commercialisation du Bétail dans les Pays du Conseil de l'Entente). 1980. 405 p. [Out of Print.]

10. Shapiro, Kenneth H. La Production et la Commercialisation du Bétail dans les Pays du Conseil de l'Entente: Rapport de Synthèse. 1980. 445 p. $15.00.

9. Herman, Larry A. The Livestock and Meat Marketing System in Upper Volta: An Evaluation of Economic Efficiency (Monograph IV, Livestock Production and Marketing in the Entente States of West Africa Project). 1983. 266 p. $10.00.

8. Eddy, Edward D. Labor and Land Use on Mixed Farms in the Pastoral Zones of Niger (Monograph III, Livestock Production and Marketing in the Entente States of West Africa Project). 1979. 493 p. [Out of Print.]

7. Staatz, John M. The Economics of Cattle and Meat Marketing in Ivory Coast (Monograph II, Livestock Production and Marketing in the Entente States of West Africa Project). 1979. 589 p. $15.00. [Out of Print.]

6. Delgado, Christopher L. Livestock versus Foodgrain Production in Southeastern Upper Volta: A Resource Allocation Analysis (Monograph I, Livestock Production and Marketing in the Entente States of West Africa Project). 1979. 427 p. [Out of Print.]

5. Shapiro, Kenneth H. Livestock Production and Marketing in the Entente States of West Africa: Summary Report. 1979. 528 p. $12.50.

4. Berg, Elliot J., et al. Commercialisation, Politique des Prix et Stockage des Céréales au Sahel: Etude Diagnostique - Tome I, Synthèse avec Compilation Statistique et Bibliographie Annotée. 1977. 164 p. $8.00
Tome II, Etudes des Pays. 1977. 129 p. [Tome II - Out of Print.]

3. Berg, Elliot J., et al. Marketing, Price Policy and Storage of Food Grains in the Sahel: A Survey - Volume II, Country Studies. 1977. 105 p. $10.00.

2. Berg, Elliot J., et al. Marketing, Price Policy and Storage of Food Grains in the Sahel: A Survey - Volume I, Synthesis with Statistical Compilation and Annotated Bibliography. 1977. 152 p. $8.00.

1. Berg, Elliot J. The Economic Evolution of the Sahel. 1975. 258 p. $7.50. [Out of Print.]

Discussion Paper Series

CRED publishes discussion papers, providing preliminary reports on the research (institutional or personal) of its senior research staff. In many cases, revised versions of these papers are later published in academic journals or elsewhere.

Discussion papers marked with an asterisk (*) are available in both French and English.

Prices: Individual discussion papers may be purchased for $3.00 each for delivery to a North American country, or $5.00 each for other continents (to cover postage and reproduction costs). Subscriptions are available on an exchange basis for publications from other institutions.

*127. Plane, Patrick. "Exchange Rate Policies in Africa and the Requirements of Stabilization and Structural Adjustment," September, 1990. 26 p.

126. Herman, Larry and Barlow, Robin. "The Impact of Agricultural Policy Reforms on the Output of Selected Crops in Niger," August, 1990. 21 p.

125. Bernasek, Alexandra and Porter, Richard C. "Private Pressure for Social Change in South Africa: The Impact of the Sullivan Principles," August, 1990. 44 p.

124. Metzel, Jeff and Casey, Frank. "An Economic Evaluation of a Phosphate Basal Dressing Scheme for the Niamey Department," March, 1988. 32 p.

123. Iyengar, Murali and Porter, Richard C. "South Africa without Apartheid: Estimates from General Equilibrium Simulations," July, 1988. 69 p.

122. Barlow, Robin. "Explanations of Recent Economic Growth and Contraction in the Middle East," December, 1989. 26 p.

121. Barlow, Robin. "Demographic and Other Determinants of Economic Growth," September, 1989. 31 p.

120. Bastone, Sandra. "The Impact of Agricultural Development from an Intrahousehold Perspective," January, 1988. 18 p.

119. Grobar, Lisa M. and Porter, Richard C. "Benoit Revisited: Defense Spending and Economic Growth in LDCs," June 1987. 34 p.

118. Porter, Richard C. "Recent Trends in LDC Military Expenditures," June 1987. 28 p.

117. Derman, Bill. "River Basin Development: Dilemmas for Peasants and Planners," February 1987. 15 p.

116. Brux, Jacqueline M. "Economic Analysis of Buffer Stocks to Stabilize the International Grain Markets: A Literature Review," September 1986. 46 p.

*115. Barlow, Robin. "Correlations Between Population Growth and Economic Growth," March 1986. 11 p.

114. See 'Special Publications' section: The Ralandia Case Studies have become Special Publications (SP) Nos. 2 and 3. They are no longer available as Discussion Paper No. 114.

113. Collange, Gérald. "Econometric Models of Governmental Aid to Multilateral Agencies," February 1986. 21 p.

112. Kleve, J.G. "Planning Experience in Tunisia, Burundi and Syria," September 1985. 15 p.

111. Sherman, Jacqueline R. "Grain Marketing Decisions of Subsistence Farmers in Burkina Faso," December 1984. 29 p.

110. Kouassi, Bernard Y. "Toward An Adoption Decision Model for Processed Foods in Developing Nations," November 1984. 34 p.

109. Kouassi, Bernard Y. "Urban Consumption of Beef in the Ivory Coast," September 1984. 22 p.

108. Gordon, David F and Parker, Joan C. "The World Bank and Its Critics: The Case of Sub-Saharan Africa," March 1984. 43 p.

107. Ranney, Susan I. and Kossoudji, Sherrie. "Historical Migration Patterns and Current Temporary Migration: The Case of Mexican Migration to the U.S.," December 1983. 35 p.

106. Chambas, Gérard. "Rural Income Distribution in Senegal: Changes and Indicators," December 1983. 43 p.

105. Josserand, Henri P. "Small Stock, Large Dividends: Sheep and Goats in Sub-Saharan Africa," October 1983. 30 p.

104. Gordon, David F. "Which Way for Zimbabwe: Development Dilemmas and Prospects," August 1983. 27 p.

103. Grosse, Scott D. "Rural Development and Rural-Urban Migration: The Elusive Relationship," June 1983. 47 p.

102. Ranney, Susan I. "Economic Models of Planned Temporary Migration," June 1983. 26 p.

101. Ranney, Susan I. "International Capital Transfers and the Choice of Production Technique: A Simple Two-Country Model," June 1983. 21 p.

100. Ranney, Susan I. "Time Allocation and Remittance Flows: The Case of Temporary Mexican Migration to the U.S.," June 1983. 25 p.

99. Josserand, Henri P. and Brazee, Richard J. "Domestic and Foreign Effort Applied to a Fish Stock: Getting the Most Over Time, for a Change," May 1983. 14 p.

*98. Berg, Elliot J. and Ainsworth, Martha. "A Strategy for Health Care in West Africa," November 1982. 35 p.

*97. Thomas-Peterhans, Randall. "The Stratification of Livestock Production and Marketing in the Zinder Department of Niger," September 1982. 39 p.

96. Makinen, Marty. "A Benefit - Cost Analysis of Measles Vaccinations in Yaounde, Cameroon," November 1981. 20 p.

95. Porter, Richard C. "Apartheid, the Job Ladder, and the Evolutionary Hypothesis: Empirical Evidence from South African Manufacturing, 1960-1977," September 1981. 34 p.

94. Ranney, Susan I. "Terms of Trade and Domestic Distribution: A Comment," July 1981. 11 p.

93. Berg, Elliot J. "Intergovernmental Health Assistance in Francophone West Africa," June 1981. 46 p.

92. Kemal, A.R. and Porter, Richard C. "Learning by Doing While Remembering Forgetting, With Reminders From Pakistan Manufacturing Data," May 1981. 21 p.

91. Grosse, Scott D. "A Skeptical Perspective on Income Redistribution and Poverty Reduction in Sri Lanka," May 1981. 27 p.

90. Makinen, Marty; Herman, Larry A.; Staatz, John M.. "A Model of Meat Versus Live-animal Exports from Upper Volta," February 1981. 27 p.

89. Barnum, Howard N. "The Economic Cost and Benefits of an Immunization Program in Indonesia," January 1981. 37 p.

88. Ranney, Susan I. "A Note on the Proletarianization of the African Peasantry in Rhodesia," August 1980. 18 p.

87. Ranney, Susan I. "The Open Door Policy and Industrialization in Egypt: A Preliminary Investigation," August 1980. 47 p.

86. Staatz, John M. "The Economics of Cattle and Meat Marketing in Ivory Coast: A Summary," June 1980. 84 p.

85. Ross, Clark G. "A Modeling of the Demand and Supply of Food Grains in Senegal," June 1980. 68 p.

84. Berg, Elliot J. "Alternative Strategies for Zimbabwe's Growth," June 1980. 27 p.

83. Eddy, Edward D. "Prospects for the Development of Cattle Production on Mixed Farms in the Pastoral Zone of Niger: A Summary," June 1980. 91 p.

82. Barlow, Robin. "Economic Growth in the Middle East, 1950-1972," June 1980. 41 p. (Republished in International Journal of Middle East Studies, Vol. 14, 1982.)

*81. Ross, Clark G. "A Village Level Study of Producer Grain Transactions in Rural Senegal," June 1979. 51 p. (Republished in African Studies Review, V. 25, # 4, December 1982.)

*80. Ross, Clark G. "Grain Demand and Consumer Preferences: Dakar, Senegal," June 1979. 26 p. (Republished in Food Policy, Vol. 5, No. 4, November 1980.)

79. Berg, Elliot J. "Reforming Grain Marketing systems in West Africa," June 1979. 50 p.

78. Barnum, Howard N. and Barlow, Robin. "Reducing Mortality When Diseases are Interdependent," August 1978. 25 p.

77. Porter, Richard C. "The Potential Impact of International Trade and Investment Sanctions on the South African Economy," February 1979. 80 p. (Republished in Journal of Conflict Resolution, December 1979.)

76. Berg, Nancy and Elliot J. "Graduate Training of LDC Economists in U.K. Universities - A Statistical Note," January 1979. 35 p.

75. Pinckney, Annette M. "An Analysis of Grain Storage in Three Interior Sahel Countries," January 1979. 75 p.

74. Delgado, Christopher L. "An Investigation of the Lack of Mixed Farming in the West African Savannah: A Farming Systems Approach for Tenkodogo, Upper Volta," November 1978. 71 p.

73. Barnum, Howard N. and Squire, Lyn. "Consistent Aggregation of Family and Hired Labor in Agricultural Production Functions," January 1978. 12 p.

72. Bloch, Peter C. "Labor Relations in Senegal - History, Institutions and Perspectives," January 1978. 41 p.

71. Barnum, Howard N. and Squire, Lyn. "Labor Heterogeneity and Rice Production in Malaysia," December 1977. 11 p.

70. Nziramasanga, Mudziviri T. "Production from an Exhaustible Resource Under Government Control in LDCs," December 1977. 17 p.

69. Henning, Peter H. "The Urban Popular Economy and Informal Sector Production," March 1977. 66 p.

68. Porter, Richard C. "Economic Sanctions: The Theory and Evidence from Rhodesia," March 1977. 19 p. (Republished in Journal of Peace Science, Vol. 3, No. 2, Fall 1978.)

67. Heller, Peter S. "Issues in the Allocation of Resources in the Health Sector of Developing Countries," February 1977. 33 p. (Republished in Economic Development and Cultural Change, Vol. 27, No. 1, October 1978.)

66. Weisskopf, Thomas E. "Dependence as an Explanation of Underdevelopment," February 1977. 32 p.

65. Cross, John G. "A Stochastic Learning Model of Migration," February 1977. 17 p. (Republished in Journal of Development Economics, Vol. 5, No. 2, June 1978.)

64. Lopez, Michael. "The Determinants of Income and Its Distribution in four Villages in India," February 1977. 76 p.

63. Monson, Terry D. "A Note on Measuring Educational Returns in LDCs," February 1977. 12 p. (Republished in Journal of Developing Areas, Vol. 13, No. 4, July 1979.)

62. Heller, Peter S. "A Model of the Demand for Medical and Health Services in West Malaysia," October 1976. 52 p. (Republished in Social Science and Medicine, Vol. 16, 1982.)

61. Montgomery, Barbara B. "The Economic Role of the Ivorian Woman," February 1977. 49 p.

60. Porter, Richard C. "A Model of a South African-type Economy," October 1976. 42 p. (Republished in American Economic Review, Vol. 68, No. 5, December 1978.)

59. Staelin, Charles P. and Jurado, Gonzalo M. "The Impact of Export Incentives and Export-Related Policies on the Firms of the Less Developed Countries: A Case Study of the Philippines," September 1976. 29 p.

58. Heller, Peter S. and Drake, William D. "Malnutrition, Child Morbidity and the Family Decision Process," September 1976. 43 p. (Republished in Journal of Development Economics, Vol. 6, No. 2, June 1979.)

57. Heller, Peter S. "Interactions of Childhood Mortality and Fertility in West Malaysia: 1947-1970," September 1976. 33 p.

56. Barlow, Robin. "A Test of Alternative Methods of Making International Product Comparisons," September 1976. 15 p. (Republished in Economic Journal, Vol. 87, September 1977.)

55. Elliott, James A.M. "Will Rising Wages in the Controlled Sector Increase Total Employment in Less Developed Countries?," August 1976. 37 p. (Republished in Journal of Development Studies, Vol. 16, No. 1, October 1979.)

54. Saulniers, Alfred H. "The Economics of Prestation Systems: A Consumer Analysis of Extended Family Obligations with Application to Zaire," August 1976. 27 p.

53. Saulniers, Alfred H. "Unit Equivalent Scales for Specific Food Commodities: Kinshasa, Zaire," August 1976. 22 p.

52. Shapiro, Kenneth H. "Efficiency Differentials in Peasant Agriculture and Their Implications for Development Policies," June 1976. 13 p. (Republished in International Association for Agricultural Economics Occasional Paper No. 1, November 1977.)

51. Berg, Elliot J. "The Economic Impact of Drought and Inflation in the Sahel," May 1976. 35 p.

50. Kendrick, Robin, J. "A Survey of Labor Relations in Cameroon," May 1976. 39 p. (Republished in Industrial Relations in Africa, edited by Ukandi G. Damachi, International Institute for Labor Studies, Geneva, 1979.)

49. Monson, Terry D. and Pursell, Gary G. "An Evaluation of Expatriate Labor Replacement in the Ivory Coast," April 1976. 75 p. (Republished in Actualité Economique, Vol. 53, No. 2, April-June 1977, in French, and in Journal of Development Economics, Vol. 6, No. 1, March 1979.)

48. Berg, Elliot J. "Some Problems in the Analysis of Urban Proletarian Politics in the Third World," March 1976. 17 p. (Republished in Comparative Urban Research, Vol. 4, No. 1, April 1976.)

47. Ketkar, Suhas L. "Economics of Education in Sierra Leone," April 1975. 37 p. (Republished in Manpower Planning and Utilization in West Africa, International Labor Organization, 1979.)

46. Kleve, Jacob G. "The Financing of Investments in Tunisia, 1961-1971," March 1975. 41 p.

45. Kleve, Jacob G. and Stolper, Wolfgang F. "Changes in Income Distribution, 1961-1971 (Tunisia)," March 1975. 30 p.

44. Blake, Robert. "Import Controls and Production in Tunisia During the 1960s," March 1975. 41 p.

43. Heller, Peter S. "An Analysis of the Structure, Equity and Effectiveness of Public Sector Health Systems in Developing Countries: The Case of Tunisia, 1960-1972," February 1975. 105 p.

42. Heller, Peter S. "Factor Endowment Change and the Structure of Comparative Advantage: The Case of Japan, 1956-1969," January 1975. 23 p. (Republished in Review of Economics and Statistics, Vol. 58, No. 3, August 1976.)

41. Weisskopf, Thomas E. "China and India: A Comparative Survey of Economic Performance," October 1974. 43 p. (Republished in Economic and Political Weekly, Vol. 10, Nos. 5-7, February 1975.)

40. Elliott, Howard J.C. "Animation Rurale and Encadrement Technique in the Ivory Coast," September 1974. 33 p.

39. Herman, Barry M. "Multinational Oligopoly in Poor Countries: How East Africa Got Its Petroleum Refineries," September 1974. 32 p. (Republished in Journal of Development Economics, Vol. 2, 1975 and in Readings on the Multinational Corporation in Kenya, edited by Raphael Kaplinsky, Oxford University Press, Nairobi, 1978.)

38. Porter, Richard C. "Measuring the Cost of Granting Tariff Preferences," September 1974. 44 p.

*37. Stolper, Wolfgang F. "Investments, Employment and Output per Man in the Tunisian Economy, 1961-1971," September 1974. 112 p. (Republished in Weltschaftliches Archiv, Vol. 114, No. 3, September 1978, and in Annales Economiques, No. 14, 1980, in French.)

36. Shapiro, Kenneth H. and Muller, Jurgen. "Sources of Technical Efficiency: The Roles of Modernization and Information," April 1974. 40 p. (Republished in Economic Development and Cultural Change, Vol. 25, No. 2, January 1977.)

35. Weisskopf, Thomas E. "American Economic Interests in Foreign Countries: An Empirical Survey," April 1974. 56 p.

34. Porter, Richard C. and Staelin, Charles P. "On the Rationality of 'Cascaded' Export Subsidies and Taxes," March 1974. 9 p.

33. Hoopengardner, Thomas. "Rural-Urban Migration: A Dynamic View," January 1974. 15 p.

32. Weisskopf, Thomas E. "Sources of American Imperialism: A Contribution to the Debate between Orthodox and Radical Theories," November 1973. 46 p. (Republished in Review of Radical Political Economics, Vol. 6, No. 4, Fall 1974.)

31. Porter, Richard C. "Some Doubts About Kenya's Future as an Exporter of Manufactures," October 1973. 30 p. (Republished in Eastern Africa Economic Review, Vol. 6, No. 1, June 1974.)

30. Heller, Peter S. "An Econometric Analysis of the Fiscal Behavior of the Public Sector in Developing Countries: Aid, Investment and Taxation," October 1973. 39 p. (Republished in American Economic Review, Vol. 65, No. 3, June 1975.)

29. Porter, Richard C. "Labor Migration and Urban Unemployment in Less-Developed Countries: Comment," July 1973. 19 p.

28. Dia Bondo, Theophil Lukusa and Porter, Richard C. "A Constant Market-Share Look at African Exports in the 1960s," June 1973. 25 p.

*27. Barlow, Robin. "Planning Public Health Expenditures with Special Reference to Morocco," April 1973. 68 p. (Republished in International Journal of Health Services, Vol. 6, No. 1, February 1976.)

26. Staelin, Charles P. "A General Equilibrium Model of Tariffs in a Non-Competitive Economy," March 1973. 29 p. (Republished in Journal of International Economics, Vol. 6, No. 1, February 1976.)

25. Winegarden, Cal R. "Determinants of International Differences in Educational Effort," September 1972. 31 p. (Republished in Eastern Economic Journal, Vol. 2, No. 1, January 1975.)

24. Heller, Peter S. "The Strategy of Health-Sector Planning in the People's Republic of China," July 1972. 62 p. (Republished in Medicine and Public Health in China, edited by M. Wegman and T. Lin, Josiah Macy Foundation, New York, 1973.)

23. Heller, Peter S. "A Model of Public Sector Expenditure Dynamics in Less-Developed Countries: The Kenyan Case," May 1972. 50 p. (Republished in Quarterly Journal of Economics, Vol. 88, No. 2, May 1974.)

22. Staelin, Charles P. "The Cost and Composition of Indian Exports," May 1972. 41 p. (Republished in Journal of Development Economics, Vol. 1, No. 2, June 1974.)

21. Johnson, George E. "The Determinants of Hourly Earnings in Urban Kenya," May 1972. 36 p.

20. Osayimese, Izevbuwa G. "An Application of Control Theory to Rural-Urban Migration and Urban Unemployment," May 1972. 19 p. (Republished in Geographical Analysis, Vol. 4, No. 2, April 1974.)

19. Fields, Gary S. "Private Returns to Investments in Higher Levels of Education in Kenya," April 1972. 16 p. (Republished in Education, Society and Development: New Perspectives from Kenya, edited by David Court and Dharam P. Ghai. Oxford University Press, Nairobi, 1974.)

18. Naranjo, John and Porter, Richard C. "The Impact of the Commonwealth Preference System on the Exports of Latin America to the United Kingdom," March 1972. 37 p. (Republished in Journal of Development Studies, Vol. 9, No. 4, July 1973.)

17. Kennedy, Michael. "An Empirical Evaluation of the Two-Gap Model of Development," November 1971. 29 p.

16. Aho, C. Michael. "The Use of Export Projects in Allocating Foreign Aid Among and Domestic Resources Within Developing Countries," July 1971. 59 p. (Republished in Journal of Development Studies, Vol. 10, No. 3/4, April/July 1974.)

*15. Andriamananjara, Rajaona. "Labor Mobilization: The Moroccan Experience," April 1974. 119 p.

14. Hutcheson, Thomas L. and Porter, Richard C. "The Cost of Tying Aid: A Method and Some Colombian Estimates," January 1971. 58 p. (Republished in Princeton Studies in International Finance, No. 30, March 1972.)

13. Berg, Elliot J. "Wages and Employment in Less-Developed Countries," December 1970. 23 p. (Republished in The Challenge of Unemployment to Development and the Role of Training and Research Institutes of Development, OECD, Paris, 1971.)

12. Adalemo, Isaac Aylinde. "Distribution of Market Centers, Market Periodicities and Marketing in Northwestern Nigeria," August 1970. 57 p. (Republished in African Urban Notes, Vol. 5, No. 2, Winter 1970.)

11. Porter, Richard C. "Birth of a Bill Market," August 1970. 20 p. (Republished in Journal of Development Studies, Vol. 9, No. 3, April 1973.)

10. Stolper, Wolfgang F. "Limitations of Comprehensive Planning in the Face of Comprehensive Uncertainty: Crisis of Planning or Crisis of Planners," October 1969. 44 p. (Republished in Weltschaftliches Archiv, Vol. 107, No. 1, March 1971.)

9. Eckstein, Peter C. "Toward an Integrated Theory of Tariffs," August 1969. 41 p.

8. Porter, Richard C. "The Effectiveness of Tax Exemption in Colombia," July 1969. 41 p. (Republished in Weltschaftliches Archiv/Review of World Economics, Vol. 108, No. 3, September 1972.)

7. Eckstein, Peter C. "Quantitative Measurements of Development Performance: A Critique by Peter Eckstein and a Reply by Irma Adelman and Cynthia Taft Morris," April 1969. 37 p. (Republished in American Economic Review, Vol. 60, No. 1, March 1970.)

6. Porter, Richard C. "Some Implications of Post-War Primary Product Trends," February 1969. 17 p. (Republished in Journal of Political Economy, Vol. 78, No. 3, May-June 1970.)

5. Berg, Elliot J. "Trade Unions and Wage Levels - The Nigerian Case," January 1969. 19 p. (Republished in Economic Development and Cultural Change, Volume 17, No. 4, July 1969.)

4. Berg, Elliot J. "Industrial Relations Systems in Colonial West Africa: A Comparative Analysis of French West Africa and the Gold Coast," December 1968. 50 p. (Republished in African Dimensions: Essays in Honor of William O. Brown, edited by Mark Karp, Boston University, Boston, 1975.)

3. Stolper, Wolfgang F. "Economic Growth and Political Instability in Nigeria: On Growing Together Again," November 1968. 38 p. (Republished in Growth and Devleopment of the Nigerian Economy, edited by Carl K. Eicher and Carl E. Liedholm, Michigan State University Press, East Lansing, 1970.)

2. Eckstein, Peter C. "Accounting Prices as a Tool of Development Planning," February 1968. 84 p.

1. Berg, Elliot J. "Wage Structure in Less-Developed Countries," January 1968. 51 p. (Republished in Wage Policy Issues in Economic Development, edited by Anthony D. Smith, International Institute for Labour Studies, Geneva, 1969.)

Please refer to the Discussion Paper Number (DP#) when requesting one of these titles.

*Available in French and English.