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Redressing Inequality in the Post-Apartheid South African Economy

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I. Introduction

Introduction

Most of us have been brought up to think of South Africa as unique among the nearly 200 countries on this planet, alone in its continued official assertion of racial inferiority and its continued official support of racial exploitation. Originally an obscure word in an obscure language, apartheid has come everywhere to mean a complex web of government intrusion into the market system intended to direct the fruits of economic progress to one race.

Now that the official economic underpinning of apartheid is being finally dismantled, it is important that we stop thinking about South Africa only as a racist, or even as a racial, state. It becomes a majority-governed state which has inherited a frightening degree of inequality -- indeed, redressing that inequality will be its highest policy priority for generations to come. Accordingly, in the rest of this section, I will look at South Africa in two ways, first as "just another" middle-income economy in the world, and second as a country fraught with apartheid's legacy of inequality and inefficiency.

South Africa as a "Middle-Income" Country

The World Bank classifies all its member countries as "low-income", "middle-income", and "high-income" economies.[2] The current definition of a "middle-income" economy is one in which the GNP per capita in 1988 was greater than US$545 but less than US$6,000. 54 countries thereby qualify as "middle-

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1. Professor of Economics, University of Michigan, Ann Arbor MI (USA) 48109. I have been assisted by several students in the preparation of this paper. Charles Brune did most of the work on education and conducted all the simulations concerning future nonwhite enrollment problems. Dara Crowfoot did most of the work on Chile, and Kami Merrill did much of the work on Zimbabwe. Petra Riemer-Hommel and Kevin White collected many of the data on agriculture, wealth, and inequality and prepared preliminary drafts of some of the background material on these subjects. Dale Avery, Frank Child, and James Ellis read the first draft of this paper in its entirety and offered many helpful comments and corrections.

2. Economies with populations less than one million are grouped separately.

income". These are further divided into the "lower-middle-income" economies, at less than US$2,200, and the "upper-middle-income" economies, at greater than US$2,200 -- 37 in the former and 17 in the latter. South Africa falls just over the dividing line, with its GNP per capita in 1988 at US$2,290.

All "middle-income" countries, by definition, have at some time in their history started to grow. And, again by definition, none has grown enough to attain "high-income" status. Some started late and have not yet had time; others started long ago but have faltered. It is interesting to look at the group of large, "middle-middle-income" economies whose basic World Bank data keep closest company with South Africa.[3] Table I.1 shows the GNP per capita and its recent growth for South Africa and ten "comparable" countries.

Table I.1

Population, Output, and Growth of Large "Middle-Income" Economies

Country	Population (1988)	GNP/Pop (1988)	GDP/Pop Growth Rate (1965-80)	GDP/Pop Growth Rate (1980-88)
Peru	20.7	US$1300	1.1%	1.1%
Chile	12.8	1510	0.2	0.2
Syria	11.6	1680	5.3	-3.1
Mexico	83.7	1760	3.4	-1.7
Malaysia	16.9	1940	4.8	2.0
Brazil	144.4	2160	6.4	0.7
South Africa	34.0	2290	1.4	-1.0
Algeria	23.8	2360	3.7	0.4
Argentina	31.5	2520	1.9	-1.6
Venezuela	18.8	3250	0.2	-1.9
Korea	42.0	3600	7.6	8.7
Average	40.0	US$2287	3.3%	0.3%

Notes:

1. Population in millions of persons; GNP/Pop in US$ per capita; growth rates per annum.
2. The average at the bottom of each column is the unweighted average of the entries.

Source: Squire, 1991, pp. 178-181, 228-229.[4]

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3. The data in all the tables of cross-country comparisons in this paper are for large countries (i.e. population greater than ten million people) with GNP per capita between US$1,300 and US$3,600 in 1988 (South Africa's was close to their average). If the number of countries in these tables were extended further from South Africa in GNP per capita, the next lower qualifying country below Peru would be Turkey (US$1,280, 44% below South Africa), and the next higher above Korea would be Portugal (US$3,650, 59% above South Africa).

4. The World Bank adjusts the data of particular countries in ways that are not easy to uncover. These adjusted numbers have always been used in tables such as this one in order to achieve comparability across the countries' data. But curious discrepancies with country sources do arise.

These eleven countries are a very diverse group, united by little beside their levels of income per capita and the fact that all were, at one time or another, colonies of Western European countries (or Japan). But the dates of their independence, the sizes of their indigenous populations at the time of independence, and their growth rates over the past quarter century all vary greatly. South Africa stands out in this diversity as having one of the weakest recent growth records. Indeed -- and perhaps ironically -- it was passed in GNP per capita during the 1980s by Algeria, the last nation (among this group) to become independent of colonial domination and white preference.

The "middle-middle-income" economies look much more alike in their composition of output, as Table I.2 shows. For these countries, with the exception of Syria, agriculture nowhere comprises as much as 15% of the GDP, and industry has everywhere grown to at least 35% of GDP. The apartheid policies of South Africa display themselves in Table I.2 only through the low agricultural productivity of its "native reserves", which puts the overall agricultural contribution to GDP at the lower end of the distribution among these countries.[5]

Table I.2

Composition of GDP in "Middle-Income" Economies, 1988

	Percentage Distribution of GDP			
Country	Agriculture	Industry	(Manufacture)	Services
Peru	12%	36%	24%	51%
Syria	38	16	na	46
Mexico	9	35	26	56
Brazil	9	43	29	49
South Africa	6	45	25	49
Algeria	13	43	12	44
Argentina	13	44	31	44
Venezuela	6	36	22	58
Korea	11	43	32	46
Average	13%	38%	25%	49%

In Table I.1, for example, the population of South Africa is estimated to be 34.0 million in "mid-1988", but it was already nearly 34 million in the South African 1985 census.

5. "Native reserve" was the original term for the land reserved for blacks. The term changes periodically; currently, it is the "homelands".

Notes:

1. Chile and Malaysia are omitted for lack of comparable data.
2. na means not available.
3. Manufacture is included in Industry.
4. Services include all other and unclassified GDP.
5. The average at the bottom of each column is the unweighted average of the available entries.

Source: Squire, 1991, pp. 182-183.

Looking at aggregates, or near aggregates, in this fashion at the start is useful because it lets us see South Africa as "just another" of the many large countries that are no longer "poor" but are not yet "rich". It reminds us that South Africa has grown a long way from the poorest nations, and that South Africa is not guaranteed to continue its passage into the richest nations. But to dwell on these aggregates long is to ignore the tremendous inequities that hide beneath them. It is time to begin our review of how the South African government created this inequality and what the South African government has done in recent years to withdraw the state's enforcement of racial inequality.

The Building and Dismantling of Apartheid

The construction of the largest twentieth-century state apparatus for racial discrimination and domination is well known and requires only a brief recounting here. For practical purposes, the South African system of legally differential racial opportunity was erected in this century, essentially in two phases, the period between the formation of the Union of South Africa in 1910 and the Second World War, and the period of apartheid since 1948, under the rule of the Afrikaner-dominated National Party.[6]

In the earlier period, from 1910 to 1948, the concern of whites was to keep black labor cheaply available to white farmers and to protect white labor from the competition of black labor. Most of the land of South Africa was reserved for white ownership. Not only did this directly enrich the whites who came to own and farm this land, but it also guaranteed a cheap labor supply by reducing the land-labor ratio, and hence the opportunity cost of

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6. Fuller descriptions abound. The best are found in Thompson, 1990, from an historical viewpoint, and Lipton, 1985, from an economic viewpoint. I have provided a theoretical analysis of the workings of "the Southern-African-type economy" (Porter, 1978), and my model has been much and interestingly extended in a number of directions by Lundahl, 1982, Findlay and Lundahl, 1987, and Wintrobe, 1991.

labor, in the "native reserves". But this, in turn, opened up the possibility that black workers would compete with white workers and keep down the wages of both. White workers were determined to prevent this, and they gradually succeeded in erecting a series of laws restricting black employment opportunities: "pass laws" to reduce black labor mobility, particularly into the cities; "job reservation" to forbid the hiring of nonwhites for certain types of jobs; and the "civilized labor policy" to fix high wage rates on certain occupations (on the grounds that whites needed these incomes to live in "civilized" fashion).

In the first half of the century, the discrimination concerned land ownership and labor competition. Whites were predominantly unskilled and rural, and the laws of this period increased their assets and earnings. But South Africa changed. Whites became increasingly educated and skilled, and these workers no longer risked competition from blacks to whom the state provided neither education nor training. Moreover, South Africa became increasingly urban and industrial, and what was once a dispersed and rural black population was becoming a concentrated and urban black population.

Apartheid, after 1948, was therefore concerned with two new and different problems. First, it was necessary to control the pace at which black labor moved into and settled permanently in the "white metropolitan areas". The pass laws needed supplementing in various ways. Black people were declared citizens of "homelands", and their stay in the cities was labeled temporary. They were forced to reside in particular parts of the cities -- Soweto began as a little "southwest township". And efforts were made to locate industry outside of the cities, in "border areas", so that their increasingly black labor force would be less near and urban.

The second concern of post-1948 apartheid was the maintenance of an orderly dynamic on the industrial job-ladder.[7] Educational opportunities, not to mention peer pressure, automatically reserved the top jobs for whites; and the maintenance of full employment among whites (and sufficient job reservation for those unable to do skilled jobs) insured that none would be driven to apply for the jobs at the bottom of the ladder. The potential

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7. See Porter, 1984.

problem was at the "switchover rung" on the job ladder. Just above that rung, the jobs were occupied by unskilled (by white standards) and quite high-paid white workers; just below that rung, the jobs were occupied by skilled (by nonwhite standards) and quite low-paid nonwhite workers. With industry expanding sufficiently rapidly that, even after allowance for productivity increases, there were never enough white applicants for all the jobs earmarked to them in the upper part of the job ladder, the switchover rung was constantly being raised. Left to the profit motive, factory owners would have promoted their most talented nonwhite workers so rapidly into the lowest white-occupied rungs that either unemployment or falling real wages among the least skilled whites would have occurred. White unions and government policies insured that the pace at which jobs were switched over to nonwhites would be slow enough that there would always be full employment for whites and that the employed white workers would share (through wage increases) in the labor-cost savings that occurred whenever jobs were switched over.

Throughout the history of civilization, slave-owning societies were able to maintain racist economies profitably and successfully for long periods of time by keeping their slaves illiterate, rural, and working at mindless tasks. South Africa in the 1960s and 1970s increasingly ignored all three of these lessons. As nonwhites were moved up the job-ladder, the higher-rung jobs into which they moved required skills that could only be acquired with education, and the white government began reluctantly to provide public schooling for nonwhites. Already by 1948, there were more blacks than whites in South Africa's "white cities", and the dominance of manufacturing in South African growth meant that blacks were gathering in larger and larger numbers in dense and congested urban townships and factories.[8] And finally, nonwhites at the top of their part of the job-ladder were increasingly being asked to provide imagination, initiative, and responsibility to their ever more complex tasks. Internal security was becoming an ever more expensive problem for South Africa.

The economics of apartheid has always been suspect. It requires a interrelated collection of artificial distortions, especially in the labor

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8. Karl Marx also thought that the density and proximity of workers, as capitalism spawned larger and more concentrated industry, would lead to revolution, although he had a class revolution, rather than a racial revolution, in mind.

markets, and it needs no leap of free-market faith to believe that these distortions will lead to inefficiency, reduced profit rates, and ultimately slower growth. But the evidence of the 1950s and 1960s belied this, as South Africa grew at rates comparable to other "middle-income" economies. Only in the late 1970s did the growth rate begin to fall; but when it fell, it fell, rapidly and toward zero. The shortages of skilled labor, the divestment of foreign corporations, the concern for internal security, the flight of capital, the expansion of industries to promote autarky rather than comparative advantage, the closing of export and international capital markets -- all combined to stop growth.

The Extent of the Inequality

While the politics of independence in South Africa is still very uncertain, the economics is clear. The government of South Africa has abandoned apartheid, if by that word we mean the official state support and implementation of racially discriminatory economic policy. How much of apartheid will be continued by other means -- by custom, by unions, and by white dominance of the "commanding heights" of the economy -- is not yet clear. Even if all discrimination were to end completely today, however, the legacy of apartheid is a degree of inequality that will be with us for generations.

Gini coefficients are often used to measure inequality. South Africa's in 1975 was 0.68 (McGrath, 1984, p. 55), which is an astoundingly high number among the economies of today's world. Among developed economies, Gini coefficients usually range around 0.35 to 0.40; and only a few studies of developing countries have generated Gini estimates as high as 0.60. But no single number, however high, can show the extent and diversity of the inequality in South Africa. The Gini coefficient within the white population is quite low, which makes the inter-group disparities even starker. There are in South Africa not only whites and blacks but "coloreds" and "Asians", whose incomes generally fall between whites and blacks; this in itself is another force for a lower Gini coefficient, and it makes the magnitude of the observed Gini starker yet. Recent studies of income distribution in South Africa suggest a decline in the inequality since 1970 (Lewis, 1990, pp. 38ff). This decline is a byproduct of the rising urban and manufacturing wages received by

black workers since 1970, but the narrowing of urban black-white differentials simply creates a widening of the disparities among blacks, for rural black living standards have not risen as much, if at all.

Everywhere, the poor do not save as much as the rich as a proportion of their incomes, and hence inequalities in the distribution of income lead over time to even greater inequalities in the distribution of wealth. With only a very modest housing stock and a few consumer durables, blacks have come to own almost none of the wealth of South Africa. This wealth is not inconsiderable. In 1985, the gross tangible, reproducible assets of South Africa were on the order of US$70 billion; after subtraction of South Africa's international liabilities, the net worth of South Africa was around US$30 billion -- counting neither the educational capital nor the underground resource capital.[9] Almost none of this is now owned by nonwhites. In short, as Stephen Lewis puts it,

> ... racial discrimination, by custom and law, has deprived the majority of South Africa's population of access to almost every mechanism by which most people in a society gain a share in economic development. Ownership of land and natural resources, as well as permission to conduct business, was prohibited or was available only on application; access to education and training was restricted; and higher-skilled jobs for those with adequate training were put out of reach .... (Lewis, 1990, p. 35)

Exactly what will a fully democratic South African government do about this inherited inequality? The broad outlines have been made clear over the past third of a century. Beginning with the Freedom Charter, written by the Congress of the People in June 1955 and since adopted by the African National Congress (ANC), the economic objectives of a free South Africa have been often repeated. In Section II, I look first at this Freedom Charter and then at the policies that a free South Africa can utilize to redress its inherited inequality, especially in the areas of education and agriculture.

Income redistribution is expensive, especially if it is done by adding to the incomes of the poor rather than subtracting from the incomes of the rich. The question naturally and quickly arises as to where South Africa will find the resources for its policies. In the long run, growth will be needed to

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9. These numbers are my own rough estimates and are based entirely on published, official, South African sources.

provide the resources, but South Africa needs resources in the short run to begin to alleviate the worst effects of poverty. In Section III, I examine whence these resources might arise for a post-apartheid South Africa.

Finally, there is the need to distinguish promising from unpromising policy. Theory helps, but experience teaches. And the experience of others teaches cheaply. In Section IV, I look at the efforts of other countries to attack inequality in the recent past in order to gather lessons about how different policies may succeed or fail.

There are some implications of all these points for United States policy, and these are spelled out in a brief final Section V.

II. Policy Directions for Redressing Inequality

Introduction

It is almost too easy for an outsider to ignore the hopes, frustrations, and politics of a free South Africa and to offer a program for redressing the inequalities of apartheid. In the short run, this requires avoiding policies that will reduce output and focusing on policies that improve the lot of the poorest. The provision of better health care, housing, and other social services, particularly in the rural areas, is called for -- how much being limited only by the will and the resources available to the task. In the long run, it requires policies that increase the wealth of the poor. There are three kinds of wealth, and each is unique in the kind of redistribution that can be practiced. Human capital cannot be redistributed at all and can be equalized only gradually, through education and training. Land, at the other extreme, cannot be created, and greater equity of ownership can be achieved only through overt redistribution, gradual or sudden, compensated or confiscatory. And finally, tangible, reproducible capital can be either redistributed or created. It can be redistributed quickly through nationalization or other overt transfer of ownership, with all the concomitant risks to output and growth. Or it can be created slowly out of the gradually rising income, saving, and investment, with all the frustrations of the long time, slow pace, and unclear outcome of the process.

More than three decades ago, the Freedom Charter discussed these options, though in less technical and economic ways. Nevertheless, its four major policy directions are clear:

1. The removal of constraints on the allocation of labor. This, of course, is the very aspect of apartheid that has proved the first, and for the white polity, the easiest to remove -- it has proved so in the 1980s, though it was hardly foreseeable in the 1950s. Still, it is interesting to review the Freedom Charter's concern with labor opportunity:[10]

   a. "All people shall have equal rights to trade where they choose, to manufacture and to enter all trades, crafts and professions."

   b. "Freedom of movement shall be guaranteed to all who work on the land."

   c. "The police force and army shall be open to all on an equal basis ...."

   d. "All who work shall be free to form trade unions ...."

   e. "Men and women of all races shall receive equal pay for equal work."

   f. "Child labor, compound labor, the tot system and contract labor shall be abolished."

   g. "All people have the right to live where they choose ...."

   h. "Rest, leisure and recreation shall be the right of all."[11]

2. Immediate assistance to the poor. Public provision of social services was sought in a number of areas, the emphasis being on health, housing, harvests, and hunger:

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10. All quotes below are from the Freedom Charter (adopted by the Congress of the People, 26 June 1955, in Kliptown, South Africa), as reported in Suckling and White, 1988, pp. 205ff.

11. Restrictions of the kinds enumerated above, to the extent that they are grounded in law, are essentially already removed.

a. "The state shall help the peasants with implements, seed, tractors and dams to save the soil and assist the tillers."

b. "There shall be a forty-hour working week, a national minimum wage, paid annual leave, and sick leave for all workers, and maternity leave ...."

c. "All people shall have the right to ... be decently housed, and to bring up their families in comfort and security."

d. "Rent and prices shall be lowered, food plentiful and no one shall go hungry."

e. "A preventive health scheme shall be run by the state."

f. "Free medical care and hospitalization shall be provided for all ...."

g. "Slums shall be demolished, and new suburbs built where all have transport, roads, lighting ...."

h. "The aged, the orphans, the disabled and the sick shall be cared for by the state."

3. Long-run investments for growth and equity. There is no list here -- the concern is entirely with education. It should be "free, compulsory, universal and equal for all children". Higher education and technical training should be expanded and made available "on the basis of merit". And adult literacy should be attempted through "a mass state education plan".

4. Asset redistribution. The emphasis is on land and resource ownership, which should be "transferred to the ownership of the people as a whole". But there are two sub-emphases that ought not go unnoticed. One, unused housing and land can be, and indeed should be, occupied by those who will make proper use of it. And two, certain areas of industry, notably "banks and monopoly industry", should be nationalized.

There are many elements to this Freedom Charter, but three clear strands run through it -- and indeed, through almost all the subsequent cries for post-apartheid reform in South Africa. There is a cry for immediate provision of social services to the poor. There is a cry for greatly expanded educational opportunity for those so long denied in this respect. And there is a cry for the more efficient and equitable utilization of the land.[12] The first involves a tradeoff between consumption now and consumption later; economists can say much about this choice, but in the end it is a political matter. Economists can say more about the second and third strands -- hence, it is with education and land that the remainder of this section is concerned.

Expanding Education

First impressions of South African education are of striking contrasts. The difference in the quantity of resources now applied to the white and the black educational systems are such that, within the geographical confines of this one country, there exist two entirely separate schooling systems. The white educational sector is comparable to that of many advanced economies, while that of the black population is comparable to that of a "low-income" developing economy. These differences are not without economic implications for the future of blacks in South Africa. Currently, 68% of the blacks in rural areas have not received any schooling.[13] This structure of the educational system is the culmination of a long-standing, determined effort on the part of the white minority to control the economic position and potential of blacks.

The current structure of African education dates to 1952, with the implementation of the Bantu Education Act. This gave the state complete control over all levels of African education. Prior to this legislation, not all blacks received the same level or quality of schooling.[14] The different

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12. The cries for nationalization and redistribution have been "muted" recently (Wren, 1990).

13. Only 48% of blacks aged 7-16 have received no schooling, as opposed to 85% of those aged 65 or more. For more on the South African educational system, see Lewis, 1990; Trotter, 1990; and Wilson and Ramphele, 1989.

14. In particular, the schools that had been created by churches were generally of higher quality. The success of these missionary schools was demonstrated through a record of near-perfect student attendance -- which contrasted with the average country-wide rate of attendance for black children of around one third. The net effect of the missionary schools was the creation of a black elite that was seen by whites as unsuited to the tasks required of nonwhite labor by the white sector of the economy. The concern of the South African government to control the content of black education was such that the alternative schools created in the black townships were declared illegal in 1986.

public educational systems provided to whites and blacks have generated quite different results. The number of blacks in the final year of secondary schooling was only 60% of the number of whites at the same stage in 1984, in spite of the black population in this age-group being more than six times greater.

The financial resources devoted to the black educational sector have fallen far short of those provided to the white sector. In the fiscal year ending in 1984, black schools received one seventh the subsidy of white schools. This ratio understates the true difference since a much greater proportion of white school-age children are enrolled -- the relative value of the subsidy declines to one tenth when adjusted for the number of school-age blacks. This gap remains despite a 9% rate of real growth in expenditure per black pupil per annum during 1975-1985.

The difference in the sums expended on black and white education are reflected in the quality and quantity of the resources employed in each sector. The black schools are characterized by shortages of classrooms, desks, blackboards, and laboratories. Those facilities that do exist are poorly maintained. The student-teacher ratios in the white and black sectors are 16:1 and 41:1, respectively. The low ratio in the white sector is expected to decline even further due to an annual decrease of 0.8% in the number of pupils.[15]

The quality bias is also evident in the qualifications of instructors. In 1983, two thirds of the black teachers had not obtained a senior matriculation, whereas in the white sector almost all of the instructors were professionally qualified. The environment in which teachers must operate in the black sector has created a serious morale problem. Not only are the black teachers short of resources, they must contend with increasingly hostile students that view their teachers as symbols of the system oppressing them.

Improved education is widely considered as the path to economic growth and an improved distribution of income. However, better education will only improve economic status if the opportunities to utilize learned skills are

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15. Many of the recent headline-making integrations of South African schools have been forced by the financial stresses of declining white enrollments.

available. This requires the final elimination of such barriers as color bars and union certification standards. Many color bars have already been reduced or eliminated as a result of skill shortages in the white sector, thus creating openings for blacks. But these, in and of themselves, do not guarantee a reduction in the inequality of income distribution. While education does not increase the dispersion of earnings, it does not necessarily reduce it. For example, the share of educational expenditure received by blacks in South Africa rose from 11% in 1930 to 25% in 1970, while their share of incomes remained constant, implying that other factors influence income (Soumitra, 1983).

The future of black South Africans is dependent upon the ability of the educational system to provide schooling to an ever greater proportion of a rapidly growing black population. The problem with rapidly expanding an educational system is that it takes educated people to produce educated people. Educational output is constrained by the level of previous educational output -- or, more precisely, by the numbers of the previously educated that have chosen to themselves become educators. In the simulations of this subsection, we explore the rate of expansion of the schooling sector of the South African economy by working through the dynamics of school entrance, school success, and school graduates becoming school faculty. The precise model used is described in Appendix A.

A few caveats are called for before the simulations are conducted. The parameters of the model are based on current or historical trends in nonwhite South African education; and the prediction of future values of these parameters is dependent upon factors that are difficult, if not impossible, to predict. The economic incentives facing nonwhites may change significantly in coming years, thus altering the demand for education and the supply of graduates for teaching careers. The impact of more education is generally assumed to enhance wages. However, in a country such as South Africa, large increases in the quantities of educated nonwhites may have a negative if indeterminate impact on wages. The ability of the labor market to absorb greater quantities of skilled workers is related to the growth of the economy. Furthermore, future changes in the skill requirements of various sectors of the economy will also alter relative wages. The political and social ramifications of an economy with rapidly growing numbers of educated nonwhites

are also indeterminate. Those nonwhites leaving secondary schooling will compete directly with whites having low skills. The changing role of nonwhites may also have an impact on the emigration of the more highly skilled whites.

These caveats notwithstanding, the ability of the nonwhite sector of the South African educational system to cope with the growing student population can now be examined using the model presented above. First, the results of a base case will be presented, then several variations will be explored in an effort to provide some insight into the long-run effects of policy changes in the nonwhite educational system.

The scenario referred to as the base case consists of an extrapolation of the trends currently defining the behavior of nonwhite demographics and education.[16] This base case yields a grim picture of the coming years in the nonwhite educational sector. The high growth rate in the number of teachers relative to that of the population growth rate does not insure a path that immediately leads to the provision of sufficient educational capacity. Even ignoring any possibility of physical capital constraints, the sheer numbers of the school-age population overwhelm the increase in the number of instructors for many years ahead. The growth of the educational sector will immediately begin to produce more schooled people in absolute numbers, but increasing the proportion of the population that is schooled will take longer.

The current shortfall in the number of spaces available for the school-age population amounts to slightly over 5 million (based on 40% of this age-group not attending school). Employing the growth rates described above, the difference between the number of school-age children and the number that could be accommodated by the system does not stop increasing until the year 2100. Using the same conditions, the educational system would not be in a position to cope with all school-age children until the year 2130. The thought that 140 years might be needed to provide education for "all" children of school-age is of course not realistic, but it does illustrate the magnitude of the problem.

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16. The data used are discussed in Appendix A.

Further, this simulated base case assumes the continuation of the current rates of completion of nonwhite primary and secondary students. Hence, the simulated existence in 140 years of an educational system that is able to cope with all the entering school-age children does not mean that all nonwhite children will receive a secondary, or even a primary, education. The base case simply provides for a system capable of handling the students remaining in the schools at each level. Under current completion rates, even if all nonwhite school-age children entered primary school, only 25% would complete secondary education (and only 15% with matriculation).

The base case predicts that 140 years will be required to provide sufficient openings in nonwhite schools for educating the school-age population. This case utilizes the current rate of growth in the number of teachers, namely 4.5%. For the purposes of comparison, several other rates of growth of the teaching stock were simulated. These rates were simple multiples of the 4.5% figure, namely, 9.0%, 13.5% and 18.0%. The higher growth rates lead to a shortening of the period required for the capacity of the educational system to become able to handle the numbers of school-age children. In the three cases above, the number of years required were 40, 30 and 15, respectively. A doubling of the rate of accumulation of teaching capital reduced the necessary time by roughly two thirds, while a fourfold increase reduced the time to one tenth of that originally needed. The change of the growth rate in numbers of teachers was simulated under several different cases, as defined below.

The first case examined involves increases in the proportions of non-certified instructors entering the primary and secondary levels. These are people that have completed secondary schooling with and without their matriculation. The proportions of each are the same as in the base case, thus causing no changes in the overall quality of instruction. The growth rates of 9.0%, 13.5%, and 18.0% would require that 1.25, 1.50, and 1.75 times as many people exit from secondary and enter the educational sector as before.

In an effort to simulate some improvement in teacher quality along with quantity, the growth rates above were projected employing only those individuals who had completed secondary schooling with a matriculation certificate. Under this simulation, the proportions of non-matriculated

people becoming teachers was held constant. The growth rates of 9.0%, 13.5%, and 18.0% would require that 1.41, 1.81, and 2.23 times as many matriculated students become teachers. The rate of growth of 4.5% would require that 2.5% of matriculated secondary students enter the educational sector. In this simulation, the fraction of the matriculating students who become teachers rises to 3.7% in order to generate 9.0% growth.

The third case is based on increasing the growth in the number of teachers through the use of accredited personnel only. These are people who have attended teacher training colleges or have majored in education at the university level. To generate the values that follow, the number of people with a matriculation who elect to attend tertiary education was varied. The fraction of those at the tertiary level who are pursuing studies to become an instructor remained fixed. In the base case, 35% of those leaving the secondary level continued into the tertiary level. Under the projected rates of growth of 9.0%, 13.5%, and 18.0%, the percentages continuing from secondary to tertiary would be 40%, 45%, and 52%, respectively. It should be noted that these increases would reduce substantially the numbers of well-schooled nonwhites available for the non-educational labor market. While this form of capital accumulation is the most desired from a quality perspective, it would also prove to be the most costly. And inducing more persons to enter the tertiary level in pursuit of becoming teachers is only feasible if the appropriate economic incentives exist in the job market for teachers.

The possibility of increasing the fraction of university students pursuing an education major was examined. The results indicated that no significant gains could be made in the growth rate of teachers under any plausible parameter values short of placing all nonwhite university students in an education major -- around 30% of the nonwhites attending university are already working towards a major in education.

The quality of schooling may also be varied through means other than the level of preparation of the instructors. A reduction in the number of pupils assigned to a class could yield improvements in quality that spill over to influence the drop-out rates that currently plague nonwhite students. The average ratio of students to teachers in nonwhite primary and secondary schools is 41:1 -- recall that the ratio in the white-student sector is 16:1.

Simulations in which the student-teacher ratio was reduced yielded quite discouraging results. When the teacher growth rate of the base case was used, the current ratio of 41:1 could be reduced to 30:1 in no less than 170 years. Growth rates of 9.0% and 13.5% achieved this reduction in the ratio in 50 and 25 years, respectively. The disparity in the student-teacher ratios becomes even more worrisome when the white sector is evaluated more closely. The white sector will experience an improvement in its ratio without any increase in investment over the near future simply because the numbers of white students is declining.

The drop-out rates of nonwhite and white students exhibit large differentials. Of those whites entering primary schooling, approximately 75% will complete secondary; in the case of nonwhites, this percentage falls below 20%. All of the simulations above assumed that the drop-out rate of nonwhites would not change. Hence, the simulations forecast the time required to generate sufficient openings in the schools for those students remaining in school. If the drop-out rate of nonwhites converged to that of whites, then the time required to provide adequate schooling would increase several times under any of the growth rates utilized above. Thus, a growth rate of 9% -- which is twice the current rate -- would not be sufficient to provide a level of education to nonwhites similar to that of whites even by the middle of the twenty-second century.

All these simulations are unbendingly linear, and this is disturbing from the viewpoints of both economic theory and practical reality. But such simulations do make two things crystal clear -- there is a huge nonwhite educational gap to be overcome in South Africa, and it cannot be overcome quickly.

Changing Agriculture

Just as there are two educational systems in South Africa, so are there two agricultural systems.

The so-called "white areas" of South Africa -- i.e. all of its territory excluding the "homelands" -- comprise 87% of the country's total area and 84%

of total arable land.[17] This "white" agriculture contributed only 6% of South African GDP (again, excluding the "homelands") in 1988, and this percentage has been falling since 1970; but it is quite diversified, especially compared to the "homelands" agriculture, producing livestock, horticulture, fruit, and grains, and making South Africa largely independent of imports of its basic foodstuffs. Indeed, agriculture provides some 10% of the total exports of South Africa. This diversity has followed from irrigation, which started as early as white settlement, since vast regions of South Africa are otherwise only useful for the grazing of animals. In the mid-1980s, there were some 60 thousand farms in the "white areas", averaging nearly 1500 hectares in size, mostly in natural pasture, and employing only a few workers each, almost all black workers.

There are two important features of "white" agriculture that explain its diversity and productivity. One, it is much more capital-intensive than "homelands" agriculture -- there has been heavy investment in fixed capital since the late 1960s, greatly assisted by government subvention. This mechanization of "white" farming was also encouraged by the government attempt to move blacks from "white" areas into "homelands" under the provisions of the Native Trust and Land Amendment Act of 1954. This law discouraged the maintenance of labor tenants and squatters by white farmers.

The second important feature of "white" agriculture is the extent of the government involvement in pricing and marketing. Agricultural marketing has been dominated by state intervention since the depression of 1929-1932 and the severe drought of 1933. Today, agricultural marketing is covered by the Marketing Act of 1968. By 1982, 72% of agricultural production (in terms of gross value of output) was handled by specific marketing programs, another 10% was controlled by other legislation, and only the remaining 18% was uncontrolled. The stated objectives of the Marketing Act are to secure a greater measure of stability in the prices of farm products and to reduce the price differential between producer and consumer. The marketing schemes employ a variety of techniques, but essentially all involve a board that sets minimum farm prices and arranges sales and subsidies so as to support those prices.

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17. For all of South Africa including the "homelands", only 12% of the land is considered arable.

The "homelands" comprise 13% of South Africa's total area and 16% of total arable land. 42% of the total population of South Africa officially lives in the "homelands", leading to severe overpopulation -- "homelands" agriculture cannot today provide anything like an adequate income for all the residents. Accordingly, in 1984, only 65% of the economically active population was employed in "homelands" agriculture, with a substantial proportion of the remainder working as migrant workers in the mines, farms, and cities of "white" South Africa. Indeed, agriculture produces barely 10% of "homelands" GDP, down from 25% in 1970.[18] Per capita agricultural production in the "homelands" is less than 5% of the per capita production reached in the rest of South Africa. Arable land per capita is only 0.17 hectares in the "homelands" (excluding migrants) versus 0.63 hectares in the "white" areas of South Africa, and the difference is growing due to differential rates of population growth of whites and blacks.

"Homelands" agriculture cannot sustain the residents, two thirds of the food requirements there being imported from the rest of South Africa (Halbach, 1988, p. 517). In 1955, the Tomlinson Commission concluded that, in order to provide bare subsistence to a farm family of six people, each family would need 110 acres of land, and this would have required the removal of at least half of the families then engaged in agricultural production. Even then, "homelands" agriculture would not have generated any food surplus. Halbach characterizes the current state of "homelands" agriculture as follows:

> Lack of know-how and capital with regard to modern agricultural technology, a severe shortage of agricultural credits due to lack of institutions and securities, as well as totally inadequate information and agricultural extension services .... Land resources deteriorated due to excess grazing, the fragmentation of properties, and erosion -- a process to which communal land laws, increasing population pressure, and traditional opposition to modern cultivation methods decisively contributed. (Halbach, 1988, p. 518)

The future of the poorest South Africans -- those who are both rural and black -- is totally dependent upon the ability of South African agriculture to provide them with greater output and better agricultural wages. The

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18. Government expenditure provides nearly all the rest. These government expenditures were financed by transfers from the South African government, not (obviously) from taxes on productive local activity (Lewis, 1990, p. 44).

government provision of transfers, nonagricultural jobs, and social services can improve the lot of the rural poor to some extent, and quickly, but the high numbers of people and the low productivity of "homelands" agriculture make agriculture an essential ingredient in any self-sustaining program to help the rural poorest. Some of the possibilities, and some of the problems, can be illustrated through the use of simple production functions for the "white" and "homelands" agricultural sectors and some comparative statics that explore various efficiency-enhancing and redistributive policies. The precise model used is described in Appendix B.

What the end of apartheid will mean for rural South Africa is subject to interpretation. At the very least, it must mean unrestricted labor mobility for black agricultural workers. It will probably mean much more. Five levels of change are considered here, and the simulated outcomes for output and income are shown for each. The changes are cumulative, in the sense that all the changes of the previous simulations are retained when each new simulation is explored. One caveat is especially important before launching into these simulations. The model being used is far from a general-equilibrium model, and the possible repercussions are <u>not</u> considered of changes in agricultural output on agricultural prices, of changes in the MPL on the total labor supply of these two sectors, and of changes in the MPK on the total capital stock of these two sectors.

1. <u>Labor Is Mobile</u>. At the parameter values derived above, the marginal product of labor in the "homelands" sector ranges from 0.1% to 1.4% of the marginal product of labor in the "white" sector. Clearly, the end of apartheid will free much of the "homelands" labor supply to seek the higher wages in the "white" agricultural sector. This first simulation holds the total labor supply to the two sectors constant and lets this labor redistribute itself until the MPL is equal across the two sectors (or no labor is left in the "homelands").

With this perfect mobility, almost all the labor of the "homelands" sector leaves (in all sixteen of the permutations of parameter values), the "homelands" agricultural product goes essentially to zero, the output of the

"white" farms rises by 21-59%, and total agricultural output rises by 4-37%.[19] The huge influx of labor into the "white" agricultural sector pushes down the MPL, and hence the wage rate, there by at least 42% (and in some simulations, almost to zero). None of this is surprising.

What may seem surprising is that this newfound labor mobility is no guarantee that black earnings will rise.[20] There are three effects on black incomes: 1) a positive force, through the ability to move to the higher MPL of the "white" farms; 2) a negative force, through the decline in output in the "homelands"; and 3) a negative force, through the fall in the wage rate on the "white" farms. The two negative forces outweigh the positive force in eight of the sixteen simulations -- all those where the elasticity of substitution in "white" agriculture is assumed to be 0.50 (as opposed to 2.00).

In short, labor mobility within the rural areas of South Africa may or may not improve the earnings of rural blacks. In other words, the post-apartheid pull on the current "homelands" labor is not toward the "white" farms but rather toward the cities, with all the fearsome urbanization problems that are now so well documented throughout the Third World.

2. Capital Is Also Mobile. At all the parameter values being tried here, the marginal product of capital is always two or three times as high in the "homelands" (by assumption). If capital were also unrestricted in its mobility, it would flow toward the "homelands" and increase output there. This second simulation holds the total amount of capital in the "white" and "homelands" agricultural sectors constant and lets this capital redistribute itself until either the MPK is equal across the two sectors (or no capital is left in the "homelands").[21] Note that in this simulation any capital that is reallocated between sectors still belongs to its previous owner, white in the "white" sector and black in the "homelands" sector -- the reallocation is voluntary and is not a confiscatory redistribution.

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19. Throughout the reporting of these simulations, a range of change is given, representing the lowest and highest figure produced by any of the sixteen permutations of parameter values. When a single figure is given, it is the simple average of all sixteen permutations.

20. Throughout these simulations, the phrase "black earnings" refers only to their earnings in the ("white" and "homelands") agricultural sectors. These earnings are the sum of the total output in "homelands" agriculture and the wages earned in "white" agriculture. In some simulations, where whites lend capital to the "homelands" agriculture, the part of output required to pay for that capital is of course excluded from black earnings.

21. It may seem curious that, despite the higher initial MPK in the "homelands", capital should leave; but remember, labor is also leaving and that in itself pushes down the MPK there.

With capital mobility as well as labor mobility, capital flows out of the "homelands" in twelve of the sixteen permutations. Although this induces a return of labor to the "homelands" in a few cases, the net effect is a rise in "homelands" agriculture (above the level reached in Simulation #1) in only four of the cases, and in none of these cases does "homelands" output get back as high as one fourth of its original level.

Capital mobility in itself may raise or lower black earnings (relative to the earnings of Simulation #1). It raises these earnings in thirteen of the sixteen cases, but it never changes them, up or down, by more than 5%. In short, capital mobility does little for black earnings once labor mobility has been achieved; and what little it does is of uncertain sign.

3. Some Land Is Redistributed to "Homelands" Owners. Land-scarce "homelands" agriculture is, in this simulation, given 20% of the "white" agriculture land -- I do not worry about the financial details of the transfer, only its subsequent effect on outputs and incomes. Labor and capital continue to be mobile. The transferred land, however, is no longer farmed by the "white" agricultural production function (i.e. A_w, B_w, etc.) but rather by the existing "homelands" production function (i.e. A_h, B_h, etc.) since, in the stylization of this simulation, it is assumed that none of the "know-how" or publicly provided infrastructure migrates with the land ownership.

With the increase in land in the "homelands", both labor and capital increase there (relative to the low levels reached in Simulation #2), but not by very much. In only five of the cases, for example, is the meager "homelands" capital stock any larger at the end of this simulation than it was in the base case. "Homelands" output rises, "white" farm output falls; the net effect is negative on total output in every case, as one might have expected since, when the land "moves", the production function does not move with it.

Black earnings fall in fifteen of the sixteen cases, by as much as 26%.[22] The more than doubling of the land available to "homelands" owners fails in almost every case to increase black earnings. The loss of wage income in the

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22. In the lone case where black earnings rise, the increase is only 1%.

"white" sector almost always more than offsets the increased output in the "homelands". The overall effect of the changes of these first three simulations (i.e. labor mobility, capital mobility, and new land for the "homelands") raises black earnings by 48-57% if the elasticity of substitution is assumed to be 2.00 in "white" agriculture but lowers black earnings by 77-86% if the elasticity of substitution there is assumed to be 0.50.

In short, land redistribution provides no guarantee of an increase in black earnings if the newly acquired land continues to be farmed by the traditional "homelands" production techniques.

4. "White" Agricultural "Know-How" and Infrastructure Become Equally Available in the "Homelands" Agriculture. Part of the low productivity of the "homelands" agriculture has always been that it is farmed by inferior production technique.[23] In this simulation, all the "homelands" agricultural land (including the additional 20% acquired in Simulation #3) is cultivated with the "white" production function parameters -- the dynamics of this immense educational and extension process are ignored, and only the comparative statics of the outcome are discovered.

The effects of this change, finally, are immense. Nearly one third of the black agricultural labor force works on "homelands" land, with the same proportion of the total agricultural capital.[24] Total agricultural output of the two sectors rises, to a level 15-47% above the original (base case) level.

Black earnings are still, however, not guaranteed to be higher than in the original base case. They are now higher in twelve of the sixteen cases, by 3-129%, but they have fallen in the other four cases, by 13%. The decline in the wage rates on "white" farms continues to depress black earnings, usually but not always offset by the increased mobility and land that have been offered in the various subsequent simulations.

Indeed, so strong is the effect of the lower wage rates and the increased availability of labor throughout the Simulations #1, #2, #3, and #4 that the

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23. In the parameterized production functions used here, this inferiority of technique is primarily captured by the estimates of A_w and A_h. Over the sixteen permutations being tried, the ratio of A_h to A_w ranges from 5% to 55%.

24. Nearly one third of the agricultural lands is now farmed by "homelands" owners, and there is now no economic reason why the factor proportions should be different in the two sectors.

incomes of the white owner/operators in the "white" agricultural sector has risen in every one of the sixteen cases, by 5-29%, compared to the base case scenario -- despite the loss of 20% of their land. Output on the reduced "white" land rises in half the cases, and the implicit land rental income rises in twelve of the cases; and in the cases where these do not occur, the MPK rises sufficiently on the "white" farmers' capital to cause a rise in white earnings there.

5. The "White" Capital-Land Ratio Becomes Available in the "Homelands" Agriculture. In this final simulation, the "homelands" agriculture finds itself with a capital-land ratio equal to that of "white" agriculture through the investment of new capital there -- again ignored are the dynamics and the economics, not to mention the politics, as to where the nearly half billion (1985) Rands of new capital come from.[25]

The proportions of labor and capital, relative to land, remain as in Simulation #4; about one third of the total of each factor works in the "homelands" sector. But the quantity of capital has greatly increased, by nearly one half, and this in itself raises "homelands" agricultural output by 7-15%.[26]

The new capital, by itself, raises black earnings by 15-69% over the levels attained in Simulation #4. Black earnings reach levels 44-168% above the original (base case) level. It is only here in the final Simulation #5 that a sizeable increase in black earnings is guaranteed. But one must be careful not to think that capital is more important than technology. This tempting conclusion is an artifice of the order in which Simulations #4 and #5 were conducted. Had I increased capital in Simulation #4 (keeping the technology change for Simulation #5), I would have found that black earnings rose above the base case in only half of the sixteen cases. Indeed, "white" technology alone raises black earnings by more than equalization of the capital-land ratio alone in every one of the sixteen permutations. The

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25. Slightly more than half of this large capital infusion needed is an artifice of the third simulation, whereby 20% of the land was "moved" to the "homelands" without being accompanied by any capital. This increased the already high capital-land ratio in "white" agriculture and lowered the ratio still further in the "homelands".

26. "White" agricultural output also rises by an identical percentage, since factor proportions remain identical in the two sectors. In practical terms, this means that "white" farmers are no longer "lending" capital to "homelands" agriculture, and they instead use all of their capital in the "white" sector. The MPK in both sectors of course declines, by 23-26%.

critical point, however, is not whether technology or capital is superior by itself, but that technology and capital together are powerful.

For the masses who are black, rural, and very poor in South Africa, mobility and land may help; but technology and capital -- together -- appear the surer routes to improved living standards. Merging the current "white" and "homelands" agricultures into a single efficient and equitable sector is essential, albeit difficult beyond the scope of simulations to show -- " ... there is more to land tenure than simply the abolition of two or three racist laws ..." (Wilson and Ramphele, 1989, p. 310).

Conclusion

Many of the problems of attacking inequality through education and agriculture -- both political and economic problems -- are slighted or ignored in the simulations of this section. The point is to show how many problems remain, even in these simplified settings. With respect to education, the simulations have tried to highlight the problem of expanding the supply of teachers sufficiently rapidly to get quickly to the goal of universal nonwhite literacy. With respect to agriculture, the simulations have tried to show that there is no single easy path to redressing the inequality. When inequity has grown to the magnitude found today in South Africa, the solutions will be complex, expensive, and time-consuming.

III. Resources for Redressing Inequality

Introduction

In the long run, history tells us, the resources for everything new come from growth. Redressing inequality in South Africa will ultimately be a matter of increasing the productivity of the newly enfranchised and redirecting the added outputs of a growing economy toward the welfare of the poor rather than the welfare of the rich. But it would be comforting to know that there is some "breathing room" for short-term redistributive measures while waiting for the long run to arrive. In this section, I look at the possible sources of additional resources, resources which are not now

available for South African use but which may become available to a fully democratic South Africa.

There are many possible sources, five of which I will examine at length below. Some optimistic conclusions about the overall size of this resource pool follow in the final subsection. South Africa will not have to wait for growth to begin its redistributive efforts.

International Gains from the Lifting of Sanctions

Suffering international sanctions, like proverbially hitting one's head against a wall, has the advantage of feeling good when it stops. Economists, and others, have been arguing for over a decade about the magnitude of the impact of various kinds of sanctions against South Africa, about which groups were being hurt, and about the likelihood of economic damage bringing about political change.[27] But on two things most of the writing agrees. The kinds of sanctions, and the kinds of damage, have been many; and sanctions are to some extent symmetrical -- as their imposition creates costs, so their removal creates benefits.

In this subsection, the qualitative structure of the impacts of each of the various kinds of international sanctions is discussed. The reason for repeating this oft-reported list is that it is now time to change the thrust of the discussion, from estimating the damages to estimating the kinds of gains that might appear with the removal of the sanctions.

Arms embargoes. Going back almost 30 years, restrictions on arms trade with South Africa are the longest-lived of the various sanctions against South Africa. To the extent that these sanctions have been less than complete, their cost has lain in the higher prices that South Africa has had to pay for its arms imports; and the cessation of such sanctions would mean once again cheap arms imports. But to the extent that post-apartheid South Africa realizes a reduced need for military and security preparedness (to be discussed shortly), this gain in lowered prices would not provide much benefit. More importantly, the embargo, and the threat of its tightening, has

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27. See, for examples, Hayes, 1987; Hufbauer and Schott, 1985; Jenkins, 1990; Lewis, 1990; Lipton, 1988; Lundahl, 1990; and Porter, 1979.

driven South Africa into extensive and expensive weapons production. Already by the early 1980s, South Africa could:

> produce locally to a substantial degree ... armored cars and personnel carriers; mortars and medium field guns; light observation and liaison aircraft and ground-attack fighter planes; hulls and some equipment for patrol boats; some missile types; heavy armored steel technology; basic infantry weapons and communications packs; night vision sights and sensors and some navigational instruments; mine clearing devices; most ammunition types, bombs, fuses, and propellants; and chemical weapons, tear gas, and napalm. It is a long list, and it gets steadily longer .... (Crocker, 1981, pp. 45-46)

With the lifting of arms embargoes, one of two possible gains will emerge: either South Africa's infant-industry arms production (i.e. the Armaments Corporation of South Africa, ARMSCOR) will have matured and become a viable, potential exporter despite its short production runs, or the sector can be allowed to die with a concomitant saving of subsidies and resources.[28]

Oil embargo. While the oil embargo has not prevented some continued import into South Africa of oil and oil-based products, the fear of a successful blockade, together with South Africa's serious dependence on imported oil, has driven South Africa to many costly measures ranging from stockpiles to coal gasification (i.e. the South African Coal, Oil, and Gas Corporation, SASOL) and alcohol fuels. Table III.1 shows that South Africa has always been a very high user of energy inputs, thanks to its plentiful supplies of coal, relative to other large "middle-income" countries. Thus, its extensive replacement of imports has been even more costly. As experience from other countries suggests, the measures to produce oil substitutes in South Africa are probably not economically efficient at current world oil prices, and so an end of the oil embargo threat there would open the possibility of closing resource-wasting ventures. Not trivial in this respect, though a resource of a once-and-for-all nature, South Africa is believed to have stockpiled by the mid-1980s more than two years' petroleum requirements at current consumption levels (Jaster, 1985, p. 76).

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28. For more on the size and inefficiency of ARMSCOR, see Coker, 1987, Chapter 4. Of course, the subsidies provided to ARMSCOR are only partly necessitated by inefficiencies; they are also used as a means of keeping down the recorded size of the defense budgets.

Table III.1

Energy Consumption and Imports of "Middle-Income" Economies

Country	Energy Consumption	Energy Imports 1965	Energy Imports 1988
Peru	478	3%	1%
Chile	832	5	4
Syria	931	13	18
Mexico	1305	4	1
Malaysia	784	11	5
Brazil	813	14	13
South Africa	2439	5	0
Algeria	1094	0	2
Argentina	1523	8	4
Venezuela	2354	0	0
Korea	1515	18	10
Average	1277	7%	5%

Notes:

1. Energy consumption data are for 1988 and are given in terms of kilograms of oil equivalent per capita.
2. The average at the bottom of each column is the unweighted average of the entries.
3. Energy imports are given as a percentage of merchandise exports.[29]

Source: Squire, 1991, pp. 186-187.

Import substitution industrialization. South Africa is not the only middle-income developing country to have followed the path of import substitution rather than export promotion. Hardly. The difference is that the informal, formal, and threatened embargoes to its exports and imports have forced the strategy on South Africa. The end of sanctions provides an opportunity for a switch in this strategy. The potential resource gains from such a switch are clear and large -- all the major growth successes among the newly industrializing countries (NICs) have chosen outward-oriented strategies. The magnitude of the average effective rate of protection (ERP) in South African manufacturing, some 20-30% (McCarthy, 1988, p. 9), suggests that immense amounts of resources are being wasted in protecting inefficient import-substituting firms and that immense budget subsidies are being provided

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29. The "0" for 1988 for South Africa is reported, for it is the World Bank's number, but it is suspect. The point is well taken, however -- South Africa's energy imports are low relative to the other countries.

to other firms that are potential exporters but are not exporting. And the irony of all this -- hardly novel to South Africa -- is that, after more than a half century of import substitution, the ratio of imports to GDP had fallen from 0.25 in 1920-1924 to 0.24 in 1980-1984 (ibid., p. 13).

International capital movements. There have been basically two kinds of international capital inflows into South Africa, although both have served the purpose of letting South Africa spend more than it produces, and invest more than it saves. One kind is direct foreign investment, whereby foreign businesses construct and operate industrial plants in South Africa, later remitting profit from these operations; the original money for the plants is thus provided from abroad. The second kind of capital inflow is portfolio, or indirect, investment, whereby foreigners bring foreign exchange into South Africa in order to purchase South African financial (government, corporate, and bank) assets. Historically, South Africa has relied heavily on both kinds of investment, and both kinds have suffered in recent years -- reaching zero for some kinds of investment, and even becoming net outflows for others.

The cessation of sanctions, and South Africa's reentry into the good graces of the global financial world, should reverse both of these recent trends. The gains are hard to measure but nonetheless tangible. Foreign direct investment brings with it access to advanced technology that cannot otherwise be acquired (or acquired as cheaply), and foreign indirect investment permits investment that yields a marginal product higher than the interest rate that must be paid.[30]

How much benefit to South Africa will the end of trade and investment sanctions bring? The answer clearly depends upon a number of questions that are largely beyond the realm of economics, and certainly beyond the realm of this paper. Will foreign investors be willing to reestablish direct and indirect investment in South Africa? Will foreign governments be anxious to provide aid for the inequality-redressing efforts of a majority-ruled South Africa? And what kind of use will South Africa make of its reopened access to international financial flows?

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30. This is of course the positive view of the foreign investment process. The negative side, serendipitously denied to South Africa in recent years but amply experienced by other "middle-income" NICs, is foreign direct investment in low-technology but high-profit production and foreign indirect investment to finance consumption or corruption.

Increased Taxation

The redressing of income inequality in post-apartheid South Africa involves to some extent the "leveling of the playing field", which in itself is not costly in terms of government budget; but a major part of the attack on inequality will involve increased government expenditure. It is tempting to look at increased government revenue as the best and surest source of the resources for these expenditures. It is unlikely to prove so.

Table III.2 shows the government revenues (in 1988) for South Africa and for other "middle-income" economies. The table shows total government revenue, taxes on income, profit, and capital gains, and taxes on international trade and transactions, each as a fraction of GNP.

Table III.2

Government Revenues of "Middle-Income" Economies

Country	Government Revenue	Income and Profit Taxes	International Trade Taxes	Domestic Taxes
Peru	9.0%	1.8%	1.9%	4.7%
Chile	31.7	7.2	3.0	11.4
Syria	22.6	7.3	1.3	1.4
Mexico	18.0	4.8	0.6	12.3
Malaysia	25.1	8.1	4.3	4.5
Brazil	34.4	4.0	0.6	4.7
South Africa	27.7	14.6	0.8	8.8
Argentina	19.7	1.7	2.0	6.9
Venezuela	28.2	17.4	3.9	1.4
Korea	18.3	5.5	2.6	6.8
Average	23.5%	6.6%	1.9%	5.7%

Notes:

1. All data are for 1988 and given as a percentage of GNP.
2. The average at the bottom of each column is the unweighted average of the entries.
3. Algeria is omitted for lack of comparable data.
4. The first column exceeds the sum of the next three columns by the amount of social security contributions, other taxes, and nontax revenues.

Source: Squire, 1991, pp. 200-201.

Despite South Africa's unique racial situation among these middle-income countries, its total government revenue as a fraction of GNP is very

comparable to the other countries shown in Table III.2. Where South Africa collects less revenue than most others is from taxes on international trade. There may be some scope for heavier direct taxation in the post-apartheid economy with the introduction of more progressive taxation as part of the efforts to redress inequality, but that scope will be limited by the fear of chasing off skilled labor and new private investment, both of which will be inevitably controlled by whites for many years. The process of ameliorating the living standards of nonwhites will surely mean less, not more, reliance on indirect internal taxes. And the process of increasing the international orientation of the economy will dictate that little increased revenue will be gotten there.

There is in South Africa heavy reliance on the direct taxation of personal income and corporate profit, relative to the other middle-income countries shown in Table III.2. But a clue to the source of this reliance is seen from the fact that Venezuela, alone among the others, also shows a high rate of taxation here. These taxes are shown separately for individual and corporate taxes in Table III.3. As is expected for a natural-resource exporter, South Africa shows a high rate of corporate taxation. Nevertheless, there may be scope for increasing it -- natural resources are notoriously incapable of tax flight, though they are quite capable of remaining in the ground. But it would be optimistic to think that large volumes of resources might come from such an increase.

Table III.3

Income Taxation of "Middle-Income" Economies

		Income Taxation	
Country	Year	Individual	Corporate
Peru	1981	0.48%	2.24%
Chile	1987	1.01	2.92
Syria	1986	0.78	5.97
Mexico	1985	1.96	2.18
Malaysia	1989	2.03	5.18
Brazil	1987	0.29	1.23
South Africa	1987	7.95	5.25
Argentina	1986	0.04	0.02
Venezuela	1986	0.81	8.75
Korea	1988	2.94	2.52

Average	1.83%	3.63%

Notes:

1. All data are for the year indicated (the most recent available) and are given as a percentage of GNP.
2. The average at the bottom of each column is the unweighted average of the entries.
3. Algeria is omitted for lack of comparable data.
4. Note that the different sources of Tables III.2 and III.3 yield different numbers in some cases.

Source: International Monetary Fund, 1988, 1989, and 1990.

South Africa, among these countries, already shows a high degree of development of its personal income tax base -- individual income taxes (as a percentage of GNP) are more than double any of the other "comparable" countries in Table III.3. Given that these income taxes are levied almost entirely on the white population, with its more nearly "North Atlantic" standard of living, it is perhaps instructive to compare the rates of income taxation with one of the advanced industrial countries, say, the United States. At the official "poverty level" of the United States for a family of four (US$12,500), U.S. federal taxes are zero; at a comparable South African income and family size (R33,400), income taxes are 22% of income.[31] At roughly the average U.S. family income (US$41,000, or R109,400), the U.S. income tax rate is 10% and the South African is 36%. "Rich" families (with incomes of US$87,500, seven times the U.S. poverty level, or R233,500) pay 19% in the United States and 41% in South Africa. Many Western European countries impose rates higher than the United States, but few impose higher rates than South Africa. The scope for raising personal income taxes in South Africa, either as a direct effort to reduce inequality or as an indirect effort to create resources to finance public policies to reduce inequality, seems limited.

Not only is the scope limited, but the possible costs are great. South Africa needs the skilled labor and investible surplus that can only be provided by whites for the next generation at least. In a system that already taxes whites fairly heavily, dramatic increases in this taxation risks losing

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31. The "short-form" tax tables of each country were consulted. The United States allows such a family a standard deduction of US$5,450 for the married couple, plus four exemptions of US$2,050 each, while South Africa offers a "rebate" to married persons of R1,100 (US$412) and an additional R100 (US$37) per child (up to five). In all these comparisons, the current foreign exchange rate of R2.668=US$1 (of March 1991) is used, the family of four is considered, and the relevant tax tables are applied.

both the labor and the investment. In short, the resources for reducing inequity in post-apartheid South Africa will not come from increased government fiscal revenues.

Reduced Defense and Security Expenditures

All the anecdotal evidence from South Africa indicates a large and growing devotion of government resources to security over the past three decades. "Defense expenditures rose from less than 1 percent of GDP in 1960 to nearly 5 percent by 1980" (Lewis, 1990, p. 131); " ... the rapid increases in defense expenditure [in the 1970s]" (Padayachee, 1988, p. 194); reference to South Africa's "soaring police and defense budgets .... By 1983 the defense bill had reached ... about 4 per cent of GNP ... (Lipton, 1985, pp. 231, 247); or "In 1978, defense absorbed ... 5.1 percent of the gross national product" (Thompson, 1990, p. 200). Then one looks at responsible international comparisons and finds GDP percentages like those shown in Table III.4. South Africa's military expenditures (as a percentage of GDP) consistently rank below those of comparable "middle-income" countries, and the rate of increase of these expenditures in recent decades is not unusually high. Other semi-official sources give somewhat higher figures -- for example, the U.S. Arms Control and Disarmament Agency suggests 4-5% for the 1970s (Crocker, 1981, p. 14) -- but even the higher estimates are not exceptional.

Table III.4

Military Expenditures of "Middle-Income" Economies

	Decade		
Country	1960s	1970s	1980s
Peru	2.9%	4.4%	6.0%
Chile	2.2	4.3	7.9
Syria	8.0	13.8	15.1
Mexico	0.7	0.7	0.6
Malaysia	2.7	5.1	6.5
Brazil	2.2	1.3	1.2
South Africa	2.0	3.2	3.8
Algeria	2.4	2.2	1.8
Argentina	2.1	1.8	4.7
Venezuela	2.0	1.9	2.4
Korea	4.6	4.8	5.2

Average	2.9%	4.0%	5.0%

Notes:

1. All data are given as a percentage of GDP.
2. The average at the bottom of each column is the unweighted average of the entries.
3. For the 1980s, the data refer to 1980-88. The Syrian data refer to 1963-1969 for the 1960s, and to 1980-1987 for the 1980s.

Source: SIPRI, 1978, 1982, 1987, and 1990.

The reconciliation of the quantitative and the anecdotal appears to reside in two places. One, much of the military expenditure has been kept off-budget, through subsidized sales from ARMSCOR and others, or through burial in the departmental accounts of other ministries.[32] And two, by 1982, South Africa had introduced compulsory service of two years for all white males, followed by two more years of annual reserve training spread over the next twelve years, none of which was recompensed at anything near the wage rates that a volunteer force would have demanded.[33]

These adjustments notwithstanding, the South African military budget has not in recent years been so large that great volumes of resources will be made suddenly available for civilian spending by its post-apartheid reduction. Indeed, given the reasonable temptation of a majority-ruled government to redress quickly the racial inequality of numbers in the South African military and police establishment, the "peace dividend" may be quite small.[34]

Under the rubric, "defense and security expenditures", this section has examined one area of government expenditure that might be dramatically reduced with an end to apartheid and its conflicts. It appears that the "peace dividend" may not be as large as some might expect. But there are other kinds of government expenditures occasioned by the persecution and prosecution of apartheid -- Michael Savage (1986) has estimated that the South African

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32. See Coker, 1987, pp. 78ff.

33. The two-year reserve obligation was reduced to one year in 1990.

34. While my intention is to maintain an unrelenting economic orientation in this paper, it is difficult not to speculate on the surprisingly small size of the South African military in the 1980s. I think it is related to the sudden, surprising, and complete willingness of the white South Africans to dismantle apartheid. Given the openness of the terrain, the power of the attack helicopter, and the impotence of the barricade, they could have maintained something resembling the status quo for much longer had they been willing to make sufficient personal and economic sacrifices -- witness the endurance of Israel amongst an even more hostile, more numerous, and better armed enemy. But South African whites seemed not so willing.

government spent some one to three billion dollars each year to maintain the apartheid framework. While defense was far and away the single largest item in his tables, it comprised only about one third of the total, with another few percentage points falling under police, justice, and prisons. Even if there is no sizeable post-apartheid saving in defense, there may be significant savings in the other two thirds of the myriad of public costs associated with apartheid. These would prove especially handy resources, since no further effort is required to put them into the public budget.

Efficiency Gains in Labor Allocation

As recently as a few years ago, the major efficiency losses caused by apartheid were thought to be the result of the extensive racial restrictions on labor allocations. These have been the first of the sources of new resources to be tapped in the dismantling of apartheid, and many of the efficiency gains on this count may already be accruing. In any case, there are clear limits to the gains from labor reallocation as long as the educational system is unchanged and as long as the capital structure is still inward-oriented. I will now look briefly at the quantitative potential for new resources from dismantling the labor-market aspects of apartheid.

A few years ago, Murali Iyengar and I developed a computable general equilibrium model of the South African economy where various counterfactual simulations were conducted in an effort to assess the efficiency gains and income redistribution that would follow from a removal of apartheid's labor-market restrictions.[35] While the model is static and calibrated to the data of 1980, which means that it is already quite obsolete given the events of the 1980s, it is capable of giving us an idea of the magnitudes of the changes that can be expected to follow from the more efficient working of the labor markets in South Africa. These net gains are of course not resource gains that fall into the hands of the government and hence become available for the use of the government in implementing new post-apartheid policies. They are efficiency gains that are distributed through the changed wages, rents, and profits of the different factors of production and the different races.

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35. Iyengar and Porter, 1990.

The model sees South Africa as a small open economy consisting of five sectors:

1. Black reserve agriculture. Unskilled nonwhite workers toil with poor land, little capital, few intermediate inputs, and primitive technology.

2. White commercial agriculture. What is white here is the ownership and management. The labor, beyond that of the white owner/operator, is done by unskilled nonwhites. Size is large, capital is significant, state support is extensive, and technology is modern.

3. Mining. Predominantly composed of large, modern, corporate gold and diamond mining operations, this sector utilizes a thin vein of mostly skilled and white labor and a large lode of mostly unskilled and nonwhite labor.

4. Manufacturing. Firms here utilize both unskilled labor, largely nonwhite, and skilled labor, increasingly provided by nonwhites as the growing scarcity of skilled white labor relative to manufacturing's needs has necessitated.

5. Other sectors. A catchall for the remaining non-manufacturing urban sectors, this sector uses both unskilled and skilled labor in the same fashion as manufacturing.

Note that in each of the five sectors, in addition to labor, there are other factors -- capital, land, and/or natural resources -- which are held constant in total and sector-specific in allocation in keeping with the static nature of the model. The returns to these nonlabor factors accrue entirely to whites except in the nonwhite reserve agriculture. Under apartheid, labor allocations are inefficiently -- not to mention inequitably -- restricted on three dimensions: 1) certain jobs are reserved for whites; 2) geographical mobility is limited for nonwhites; and 3) the state of nonwhite educational opportunities constrain the number of nonwhites that can acquire skilled jobs even when the first two restrictions do not prevent them from applying.

In Iyengar and Porter (1990), many different kinds of simulations are undertaken, but only one is important for us here. What would happen in the

short run if all labor-market restrictions were lifted? Capital ownership, magnitude, and sector allocation are all held constant, as are the educational attainments of the races. Prices and production functions are held constant, which means that no change in government policies toward subsidies and taxes of outputs, inputs, exports and imports are considered. No changes in international capital flows are contemplated. Essentially, in this simulation, all that happens is that no job is reserved by race -- although the human capital endowments, unchanged, may prevent nonwhites from attaining these newly opened opportunities -- and nonwhites are completely free to move, geographically and sectorally.

The world is not either-or; in reality, change is gradual and requires time, both ignored in the simulations of the model.[36] This problem is of course a standard one with counterfactual exercises in comparative statics, but it poses a special problem within the model as well: How fast can nonwhites move into skilled jobs in the short run, with their educational backgrounds not yet expanded? In the simulations, we looked at two extremes, called there a "slow-skilling" scenario and a "fast-skilling" scenario.[37]

With the complete removal of all labor-market constraints, the simulated GDP increases by 6-9%. The nonwhite reserve agriculture sector disappears, and the white commercial agriculture sector declines significantly, as unskilled agricultural labor leaves for the urban sectors.[38] Large output increases take place in manufacturing and other urban sectors, by somewhat under 10% in the slow-skilling scenario and by nearly 20% in the fast-skilling scenario, as nonwhites move into both skilled and unskilled urban jobs.

Not only does total output and income increase, its distribution changes extensively. Nonwhite incomes increase in total by 7-34%, depending on the skilling rate assumed. White incomes -- from all of labor, land, and capital -- rise by 5% under the slow-skilling assumption and remain constant under the fast-skilling assumption. Of course, a substantial income redistribution

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36. In Iyengar and Porter (1990), we wrote that the transition to a post-apartheid economy "will either be piecemeal and gradual, over a long period of time, or be accompanied by such upheavals and fresh distortions that the model constructed here will give little idea of the emergent economy's workings" (p. 27). Happily, it now looks as if we were far too pessimistic. The simulations we conducted also now look more relevant in a South Africa of peaceful, rapid change.

37. Operationally, the slow-skilling assumption limits nonwhites to a 10% increase in skilled jobs, and the fast-skilling assumption to a 20% increase.

38. A small increase in mining also occurs.

takes place within the white community. Incomes fall by about one half for unskilled white laborers and for white farm owner/operators. Skilled white laborers gain a little under the slow-skilling assumption, but they lose by nearly 20% under the fast-skilling assumption. Profit, all earned by whites (in the model), rise by nearly 20%.

To what extent could the government capture these resource gains to finance its post-apartheid policies? There will be, understandably from the viewpoint of redressing inherited inequality, a reluctance to tax the major gainers among laborers from this freeing of the labor markets, but the large increase in corporate profits offers itself as an attractive target. The total increase in profit simulated runs around R4 billion in 1980 prices -- converted through the simple application of the GDP price deflator into 1990 prices and then through the 1990 exchange rate into dollars, this amounts today to nearly US$7 billion.

Resource Gains from Capital Investment and Reallocation

In principle, the labor model (just described in the previous subsection) could be readily extended to explicitly involve capital and to simulate the output and income effects of capital reallocation along outward-oriented, profit-maximizing lines and of capital augmentation through increased domestic saving and foreign investment. In fact, however, such an extension is very difficult -- largely because capital is not so easily measured as labor.

Before turning down less synoptic paths, let us think about the misallocations that would have to be considered in this "ideal" general equilibrium model. There are four:

1. The allocation of capital responds to the labor misallocations of apartheid. Where apartheid reduces the quantity of labor below the free-market allocation, it simultaneously affects the marginal productivity of capital, and thereby reallocates capital away from its free-market allocation. The simulations of the previous subsection estimated the gains from freeing the labor allocation, but they

simultaneously froze the capital misallocations that had occurred under apartheid.[39] These misallocations of capital are also important.

2. The mix of skilled and unskilled labor is everywhere affected by non-market considerations such as the extent to which the government provides free schooling to its citizens. But in South Africa, this mix is even further distorted by racial considerations, and both the quantity and the allocation of capital are much influenced by the extreme scarcity of skilled labor, especially in sectors where machinery and skilled labor are complementary as in technology-intensive manufacturing. The dynamics of human capital cannot be ignored.

3. The concern for self-sufficiency as a preparation for sanctions and the difficulty of exporting into a world increasingly hostile to South African products has led to policies that drew capital into the sectors according to South Africa's consumption patterns rather than its patterns of comparative advantage. Tariffs and non-tariff import barriers, as well as non-traded goods and services, are important determinants of the allocative outcome.

4. The amount of saving and investment available to South Africa, both domestic and international, has been drastically curtailed in recent years by uncertainties and government policies.[40] And technological flows have been interrupted as well. A full picture of apartheid's misallocations must involve these dynamics.

In a post-apartheid economy, South Africa could remove each of these imperfections in the allocation of capital, and a full general equilibrium model could estimate the resource gain from each step. The expanded model would require: for step one, an explicit inclusion of capital in the production functions and assumptions about the capital market; for step two,

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39. It is considered conventional wisdom among economists of the neoclassical persuasion that apartheid reduces the rate of return to capital by interfering with the mobility of labor. This is not quite accurate. When the government forces an allocation of labor that does not equate across sectors all the relevant marginal products of the various kinds of labor, the rate of return to capital can in theory be increased or decreased. When the government artificially reduces the amount of labor (below the free-market allocation) in the capital-intensive sector, it reduces the rate of return to capital. Thus it is not the fact that apartheid distorts the labor allocation that reduces the rate of return to capital, it is the fact that apartheid reduces the amount of labor admitted into the capital-intensive, urban, manufacturing sector that reduces the rate of return to capital. For the practical person, the outcome is the same -- neoclassical-thinking capitalists in South Africa oppose apartheid's labor-market distortions.

40. By "government policies" here, I mean to include governments other than South Africa as well.

an education (and job-training) sector and assumptions about its structure and productivity; for step three, explicit handling of the protection of import substitutes and encouragement of exports through output, input, and trade taxes (and other trade barriers) and subsidies; and for step four, the inclusion of domestic saving functions and the international capital and technology flow mechanisms. It is easy to see why the work is not yet done.

But pieces of the work have been started. I discuss two below. One, by Charles Becker and Patricia Pollard (1990), attempts estimates of what I have called step three in the above list, the extent of output loss owing to the excessive South African import substitution of the past two decades. And two, by Tamim Bayoumi (1990), attempts estimates of what I have called step four in the above list, the extent of output loss due to the low rate of capital accumulation in recent years.

Becker and Pollard (1990) have examined the South African input-output tables -- six of them over the last two decades -- and found that

> ... unimpressive productivity gains and generally increasing input use coefficients indicate that the South African economy has made, at best, virtually no efficiency gains and, at worst, has become less efficient. This technological stagnation is undoubtedly in part the result of determined import substitution, aimed in part at thwarting potential sanctions. ... real South African GDP would be 20-35% higher today than it actually is had South Africa not maintained apartheid and pursued a semi-autarkic strategy. (Becker and Pollard, 1990, pp. 23, 24, 26)

They focus on the intermediate inputs in the input-output tables and notice the fraction of these inputs that is imported has declined dramatically -- and unusually among growing, industrializing economies -- since the 1960s. They then divide the growth of imported intermediate inputs into two categories: 1) the growth that would have occurred if the ratio of imported to domestic intermediate inputs had remained the same in each sector while total intermediate input demand grew; and 2) the growth that would have occurred if the total intermediate demand had remained constant in each sector while the imported fraction grew. The results are not only surprising in sign but large in size. Over 1967-1985, the growth in demand for intermediate inputs would have raised the per-annum import of intermediate inputs by more than R1 billion (in 1967 prices) if the fraction imported had remained constant. But

import substitution in intermediate inputs reduced that fraction greatly in many sectors, so that the final increase in intermediate input imports was only a little over R100 million (again in 1967 prices). Rather than the ratio of imported to domestic intermediate inputs increasing, as in most developing countries, something like 90% of the needed 1985 imported intermediate inputs had been replaced by South African substitutes over the previous 18 years (ibid., p. 23).[41]

The price of this import substitution was slower growth. There is an irony. In the very effort to insulate itself from anti-apartheid sanctions, South Africa undertook import-substitution policies that slowed its growth so much that it found apartheid unsustainable. The forward-looking conclusion of all this is that a reversal of these policies alone in the post-apartheid economy could eventually raise growth rates in the per capita South African income by 1.0-1.5% per annum (ibid., p. 26).

Another estimate of the cost of capital misallocations -- and hence of the gains from reallocations in a post-apartheid South Africa -- has been offered by Steve Lewis (1990). He looked at the gross incremental capital-output ratio (ICOR) for South Africa over 1946-1986. The decade averages are shown in Table III.5. This ICOR is an aggregate measure of productivity, and, as such, it does not divulge its precise microeconomic sources.[42] While the causes of a rising ICOR are unclear without further research, the number itself is the inverse of the average productivity of a country's incremental capital, and as such, it tells us that the ability of new capital to produce new output in South Africa began to fall in the 1970s and fell drastically in the 1980s.

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41. One should note that this study focuses exclusively on import substitution in intermediate inputs only. There is evidence in their own study (and elsewhere) that excessive import substitution occurred in final goods production as well -- and not just in fuel and arms sources. The increase in final-goods imports over 1967-1985 was only one fourth what it would have been if the ratio of final-goods imports to income had remained constant (ibid., p. 23 and Appendix B).

42. The measured ICOR implicitly involves changes not only in efficiency of capital allocation but also in labor allocations, in international trade opportunities, in government economic policies, and in production functions. Indeed, the ICOR even involves the saving (and investment) ratio. A small divigation should make this clear. Suppose the true capital-output ratio -- i.e. the ratio of total capital to total output -- is quite constant at k, all capital depreciates at rate d, and gross (domestic plus foreign) saving (which equals investment) is always the fraction s of output. Then, the ICOR can be measured by the formula, ICOR=ks/(s-dk), which is readily derived from the Harrod-Domar formula. If d=.075 and k=2.00, and these remain constant during the course of a fall in domestic or foreign saving, the measured gross ICOR will rise from 4 at s=.30, to 5 at s=.25, to 8 at s=.20, and to infinity at s=.15. None of this denies that a rise in k, due to increased inefficiency of investment, will also push up the measured ICOR; it just offers an alternative (either substitute or complementary) explanation.

Table III.5

Trend of South Africa's Incremental Capital-Output Ratio

Decade	ICOR
1946-1956	4.55
1956-1966	3.71
1966-1976	6.13
1976-1986	29.96

Source: Lewis, 1990, p. 132.

Modeling the effect of capital sanctions has begun. Bayoumi (1990) has recently developed a small but dynamic computable general equilibrium model of the South African economy where various counterfactual simulations were conducted in an effort to assess the impact on the growth rates of the overall economy and of wages, employment, and income distribution by race of the removal of international sanctions on capital flows into South Africa and the subsequent renewal of higher rates of investment there.

The model considers two sectors, mining and (nonprimary) industry, and three factors of production, capital, white (skilled) labor, and nonwhite (unskilled) labor. The rate of growth of capital is the key variable for evaluating the end of sanctions -- its annual growth rate is seen as 1% under sanctions and 3% once international sanctions are removed.[43] White labor grows at a fixed rate of 0.8%, though in some of the simulations it is supplemented by the addition of newly skilled black labor. Black labor is available in unlimited quantities from the rural sectors, in the fashion of the basic Arthur Lewis model (Lewis, 1954), at wage rates that grow at different rates in the different simulations.[44]

The base simulation continues the low annual rate of growth of capital (i.e. 1%) under sanctions and assumes that nonwhite real wages grow at 2%. The prognostication is poor: output rises at barely 1%, nonwhite employment

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43. Some simulations consider 4%; they are not reported here.

44. The production functions -- translog in capital, two kinds of labor, and time -- are econometrically estimated. Based on data of the 1970s and 1980s, the estimates suggest low rates of technological progress, high substitutability between capital and both kinds of labor, and low rates of substitutability between the two kinds of labor.

rises at barely 0.5%, and white real wages fall by almost 1%. When capital grows at 3%, several more favorable scenarios are simulated:

1. If nonwhite real wages rise at 2%, output and nonwhite employment rise at about 3%, and white real wages fall only slightly.

2. If nonwhite real wages rise at 2.5%, output rises at about 2%, and nonwhite employment and white real wages remain almost constant.

3. If nonwhite real wages rise at 2% and if skilled labor grows at 1.6% -- because white labor grows at 0.8% and newly skilled nonwhite labor makes up the difference -- output and nonwhite employment grow at 3% and white real wages fall by about 0.5%.

On the assumption -- no small assumption -- that the capital outflows of the last five years in South Africa are reversible in a post-apartheid economy, the single most telling of the Bayoumi simulations is the counterfactual simulation of the late 1980s under the 3% instead of the actual 1% growth rate of capital. On the assumption that sanctions and capital investment rate changes did not affect the nonwhite real wage rate, the annual loss to South Africa in this quinquennium was 1.6% in output, 2.7% in nonwhite employment, and 0.5% in white real wages.[45]

This is a small model, and it makes many assumptions. But it does suggest a possible burst of resources with the cessation of international capital sanctions. It also suggests that modern sector output, nonwhite employment, and white real wages will all be increased by the restoration of more rapid rate of investment and capital growth.

Conclusion

The discussion in the preceding subsections has not been in the kind of quantitative form that permits us to simply add up the various resources that a fully democratic South Africa can anticipate. Indeed, even if the material of this section had been in that form, a simple adding up would be inappropriate, since most of the elements discussed are extensively

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45. Remember, these figures refer only to the mining and industrial sectors being modeled. Output and nonwhite employment in the rural sectors of course are thereby increased, though perhaps output by very little if the marginal product of labor was already low there.

interrelated with the other elements. The best I can do at this point is to look at orders of magnitude.

Two tempting sources of resources will probably not yield much. Increased taxation cannot be relied on, and significant reductions in defense spending probably will not happen.

The removal of sanctions and the opening up of export markets and international capital markets will provide extensive resources, especially if South African government policy adapts the economy toward an outward orientation.

There are short-run gains already being garnered from the removal of the labor-market restrictions of apartheid.

And finally, the long-run gains from the reallocation of capital and renewed investment and growth can be very large. The gains on this last count can be measured in billions of dollars per year, but the more correct measure is probably in percentage points of growth in GNP per capita, which could quickly go from near zero to 2-3% per annum. Others have tried to put more precise dollar or percentage estimates to either the cost of apartheid or the gains from its end. Lewis, 1990, suggests US$2 billion a year (p. 167). As far back as 1977, L. G. Abrahamse maintained that if, "over the past thirty years there had been a natural integration on the economic front", then "GNP per capita would have been some 50% higher" (Abrahamse, 1977); in contemporary GDP, that is some US$40 billion, although it would take a generation to recapture losses of the kind Abrahamse envisages. The Investor Responsibility Research Center estimated that real GDP would have grown by 1.0-1.5% more each year over the past two decades had it not been for apartheid, and that generates a loss quite comparable to Abrahamse's by the mid-1980s.

Precise numbers, even if we could readily have them, would serve no purpose at this time. The important thing to note is that the costs to South Africa of erecting and maintaining apartheid have been high, and that there will be much symmetrical gain accruing with its deconstruction and dismantling. This should provide some, and perhaps many, resources for the kinds of policy changes discussed in Section II.

IV. Lessons from Other Efforts at Substantial Income Redistribution

Introduction

The twentieth century abounds in examples of governments determined to redistribute wealth and income. But these efforts have usually been made in countries that were already quite advanced, relative to South Africa today, or that were willing to abandon capitalism as the context for this redistribution. Among market-oriented "low-income" or "middle-income" economies (in the World Bank terminology), improvements in the income distribution generally occur slowly, often as an almost unexpected and very gradual byproduct of growth and development. A majority-ruled South Africa faces inequality on such a scale that it cannot wait to follow so gradualist a path to redistribution.

So I turn for lessons to the "middle-income" countries of Latin America, where periodic episodes of redistributive priority erupt. Unfortunately, as we shall see, the results do not lead one to optimism. But the problems these efforts encountered in Latin America are remediable, and one can certainly hope that the politics of a fully democratic South Africa will prove more responsible and stable than those of Latin America.

Before turning to the many redistributive episodes of Latin America, however, I look closely at the neighbor of South Africa that has gone on before -- Zimbabwe over the last decade.

Lessons from Zimbabwe, 1980-1990

The logical first place to look for lessons about the post-apartheid economy is Zimbabwe -- it has been providing a "pilot program" in post-apartheid economics for the past decade. Although South Africa was settled by farmers who became miners and Zimbabwe was settled by prospectors who became farmers, the historical similarities between Zimbabwe and South Africa are legion. The domination by relatively few whites in the ownership of assets, the generation of income, and the control of skilled jobs is the overwhelming feature of both the economies. At the time of independence in 1980, it was said that

> ... Zimbabwe has one of the most unequal distributions of wealth in the world, with 60 per cent of the income being earned by 4 per cent of the population. ... 45 percent of all blacks were illiterate and only 8 percent of black children were able to attend secondary school. Land ... was divided almost equally between 4,000 white farmers and 800,000 peasant families. (Herbst, 1989, p. 69)

The similarities continue. In each country, the manufacturing sector has become large and oriented toward import-substitution, although the major share of the country's employment and exports still resides elsewhere.

But there are important differences as well that should be noted before drawing lessons from Zimbabwe. It is a much smaller country than South Africa, with 9.3 million people, compared to South Africa's 34.0 million. Zimbabwe's whites comprise only 2% of its population, compared to 15% in South Africa. Zimbabwe has few minerals, relying for its exports instead on the crops of large white-owned farms. The overall level of development of the two is very different; South Africa's GNP per capita has reached US$2290 while Zimbabwe's is still only US$650, a number that puts it just into the lowest end of the World Bank's "middle-income" countries. And the industrial sector of Zimbabwe, while almost as large relative to GNP (43%) as that of South Africa (45%), is much more involved with basic consumer goods than is that of South Africa -- food, beverages, tobacco, textiles, and clothing make up 50% of Zimbabwe's manufacturing and only 23% of South Africa's. The difference is partly explained by the general level of development, but much more so by the process of import-substitution forced onto each -- South Africa prepared for sanctions by replacing the imports of the intermediate and capital goods of its essential industries, Zimbabwe reacted to sanctions by producing the consumer goods it could no longer import.[46]

The lessons that come from Zimbabwe about the movement to a post-apartheid economy are not so much indications about right and wrong policies as revelations about the dilemmas that policymakers face. The basic dilemmas are threefold: 1) whether to take the resources needed for redressing inequality from the wealthy whites and risk the emigration of their human

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46. On the effects of the international trade sanctions of the 1970s against Zimbabwe (then Rhodesia), see Porter, 1978. All the data of this paragraph are from World Bank compilations (Squire, 1991, pp. 179-189).

capital and the reduction of their willingness to invest in physical capital; 2) whether to spend large amounts of resources in the early stages and create indebtedness that may jeopardize later growth and hence the later ability to continue the egalitarian policies; and 3) whether to expend resources in areas that provide large and visible short-run gains in equality at the cost of more far-sighted and more basic reforms in the system. Each of these three dilemmas appears in almost every policy move that Zimbabwe has made over the last decade.

With respect to white wealth and income, Zimbabwe has taken a conservative approach. Little income has been redistributed, little land has been confiscated, little (economic) privilege has been removed. At one level, the results have been salutary. Agricultural output and exports have remained high, and, while there has been and continues to be a substantial outflow of skilled white labor, there has not been the mass exodus that was feared.[47] At another level, the results have been less salutary. Those skilled whites who have emigrated have left a gap that is not quickly or cheaply filled; and despite the favorable treatment, neither domestic nor foreign capital has shown enough willingness to invest to maintain a positive per capita income growth rate.[48]

Greater equality in Zimbabwe required either overall growth with the dividends aimed toward blacks, a relative reduction in white incomes, or a relative increase in black incomes. Not getting the first, not choosing the second, the Zimbabwe government turned to the third. Government spending increased in many directions -- health, education, aid to peasant farmers, employment in parastatals. Absent comparable increases in tax revenues, this has meant deficits, debt, and inflation. And this has spilled over into balance-of-payments problems and a reduction in public investment to accompany the dearth of private investment, compounding the growth problem.[49]

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47. One source states that the number of whites has "stabilized" at 100,000, down from its peak of 300,000 (Economist, 1989, p. 21).

48. For 1980-1988, GDP grew at 2.7%, population at 3.7%.

49. Overall, gross domestic investment has declined at 1.4% per annum during 1980-1988, long-term debt has reached 37% of GNP, and debt service has become 28% of export earnings (Squire, 1991, pp. 192 and 222).

Every newly independent government seeks to extend its control into the "commanding heights" of the economy. This is most readily achieved -- perhaps in the short run only achieved -- by nationalization of large private firms. In itself, such nationalization poses no problem, being a simultaneous increase in the nation's debt and its earning power. But such nationalization also raises temptations. Unwise purchasing patterns can add debt without comparable earning power; unwise investment can increase national debt, or guarantee of debt; unwise management moves can reduce efficiency; unwise hiring can increase costs; and unwise pricing policies can reduce revenues. The resulting increased deficits of parastatals can provide a serious drain on the government budget. Zimbabwe succumbed on all these counts. Not only have old parastatals proved increasingly burdensome to the budget but new ones have been continually added during the 1980s -- in a world where most countries are leaping into privatization of public enterprise. By 1989, subsidies to the parastatals had reached 14% of the national budget, and government guarantees of the debts of parastatals had reached 16% of GDP (Herbst, 1989, p. 73).

In the end, so much of the government budget has been deflected into unproductive support of state-owned enterprise that little has been left for the other activities of government, the support of infrastructure and direct investment for growth of output and employment. The Economist concluded that Zimbabwe "is living off its capital" (Economist, 1989, p. 22).

Alongside the increasingly costly public sector in Zimbabwe stood a private manufacturing sector reared behind the natural protective barrier of sanctions. When sanctions end, a choice is faced. Either the man-made protection of tariffs and other import controls are introduced, or some parts of the artificially stimulated manufacturing sector will collapse. Zimbabwe was reluctant to let the latter happen, whether from fear of its effect on white confidence or future investment or from reluctance to accept the short-run costs of capital reallocations, regardless of their long-run desirability.

The cost of protection is especially high in a small and newly industrializing country like Zimbabwe. Despite the potential of extensive regional markets, the protected firms eschew exports. This contributes to balance-of-payments problems, which in turn make imported inputs scarce and expensive. Scale efficiencies require that there be no more than one firm in

many of the protected sectors, which raises problems of exploitation or the introduction of government regulation and price-controls. After a decade of this "self-imposed protection", the costs had reached the point where an opening of the economy was almost inevitable; and a planned liberalization of Zimbabwe's foreign trade was announced by the Finance Minister in 1990. Many feel that the protection will prove to have been largely redundant and that most of Zimbabwe's industry is "remarkably efficient" (Riddell, 1988).

Despite all these problems, many of which were brought upon itself in its haste to do too much with too few resources, Zimbabwe made significant headway in the two areas where, in the end, the answer to ameliorating the racial income inequality must lie -- education and land redistribution.

The expansion of African education in Zimbabwe was incredibly rapid in the 1980s. All primary schooling in Zimbabwe has become free, though not yet compulsory. By 1985, 90% of all school-aged children were enrolled in school; between 1979 and 1986, the number of primary-school students went from 819,000 to 2,260,000. In the same period, the number of secondary-school students grew from 74,000 to 546,000. The number of primary schools almost doubled in the first five years of independence, and the number of secondary schools increased more than sixfold.[50] Students in higher education increased from 8,400 in 1979 to 30,000 by 1986.[51]

While the expansion of the educational system went smoothly, even at this rapid pace, the expansion of employment opportunities for the graduates did not. The slow growth of the economy meant that barely 30,000 jobs were being opened up each year for graduates at the "Form IV" level, while the number of such graduates grew steadily, reaching 300,000 by 1990. Slow growth is compounded by the inevitable slowing of the pace of hiring in parastatals and in education and by minimum wage policies that increase the cost of labor in the private sector. But the problem of increasing unemployment among school-leavers arose not only in the demand for skilled labor but also in the failure

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50. The number of schools tells more about the rural orientation of the educational expansion than does the number of students, who in many Third World countries continue to be clustered in the cities. Other social services were also increasingly deployed into the rural areas -- Zimbabwe has avoided the anti-rural bias in public expenditure that has permeated policy in so many Third World countries.

51. All education data are from Ministry of Education, Zimbabwe. See Merrill, 1991. Higher education comprises agricultural colleges, teachers' training colleges, technical colleges, and the University of Zimbabwe.

of the curriculum to provide the required skills. By the mid-1980s, Zimbabwe was moving toward its next task, the transformation of its educational system at all levels toward one that provided marketable job skills.

Finally, land. The highly inequitable pattern of land ownership that independent Zimbabwe inherited evolved in much the same way as it did in South Africa. White settlers not only took the best land but also moved the Africans onto small and less fertile plots in order to insure a plentiful supply of cheap labor for their farms. By 1980, over three fourths of the best farm land of Zimbabwe was taken up by whites, who (then) comprised roughly 4% of the total population. More than half the black farmers lived in marginal communal lands "where dry-land cropping is risky at best" (Weiner, 1985, p. 254).

Dramatic land reform was obviously high on the list of priorities, but the fear of disrupting output and exports on the large white-owned farms has led the government to move cautiously. The government has set up some large state communal farms, and it has conducted some resettlement of individual families; but the number of families resettled -- 34,000 on some two million hectares by 1989 -- has been barely one fifth of the number envisaged by the government's plans at the time of independence. The slow pace in the first decade of independence was caused by the need to find willing white sellers and the high budget cost of the purchases. But the pace of land reform was a self-imposed and eminently solvable problem.[52]

More serious has been the low productivity of the resettled land. This reinforces the government's fears that widespread land reform would mean declines in output and exports.[53] But there can be little doubt that, in time, techniques can be perfected for successfully cropping Zimbabwe's better land by more labor-intensive techniques. With constant, if re-formed, capital and equivalent, if altered, technology, a superior allocation of Zimbabwe's agricultural labor across its agricultural land must lead not only to greater

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52. White farmers have not only kept their land but also retained the favorable government pricing policies and marketing infrastructures for agricultural products. See Herbst, 1988, and Skalnes, 1989.

53. Even where there is no worry about alienation of previous owners, as for example with Sandinista Nicaragua's inheritance of large Somoza holdings, there seems always to be a fear that peasant operation will reduce productivity: "Breaking them [Somoza's large farms] up into a myriad of parcels would decrease or eliminate the possibility of employing the technology and machinery that had been put into them and, consequently, would reduce their productivity" (Collins, 1985, p. 60). See Goldberg, 1991.

equity but also to greater output. Weiner, 1985, maintained that there was already evidence that "yields from the settlement schemes could become comparable to those achieved on large-scale commercial farms" (p. 284), not to mention that "traditional agriculture" would utilize a larger fraction of the arable land; and that evidence has increased:

> Zimbabwe teaches that peasant farmers can be helped to flourish. Thanks to good producer prices, accessible markets and readily available inputs and credit, their food production has risen fifteenfold. Before independence, black farmers produced 7% of the country's marketed maize. Today they produce half. With labor-intensive crops like maize and cotton, family farms ... can outdo big ones. Redistribution and efficiency go hand in hand. (Economist, 3 November 1990, p. 18)

One can find much fault within Zimbabwe's economic policy since independence, but one must remember that, through it all, GDP has continued to grow -- not spectacularly, but just as fast as the average of the other "lower-middle-income" countries -- and the beginnings of the needed structural reforms have been made.

Lessons from Latin America, 1946-1973

Not only are many South American countries at similar levels of GDP per capita as South Africa, but many have gone through efforts to radically improve the income distribution while staying within a market framework such as the effort which can be expected in South Africa. Over the past half century, Argentina, Chile, and Peru have each undergone episodes of primary policy concern with greater income equality -- names like Juan Peron, Eduardo Frei, Salvador Allende, and Juan Velasco Alvarado bespeak radical egalitarianism. And the Latin American countries, while not legally racist, come close to South Africa in the extremely high concentration of wealth and inequality of income.

Moreover, the number and diversity of their experiences since World War II offer us much more evidence (and less idiosyncratic evidence) than does Zimbabwe.[54] Of course, one of the major reasons why South America offers this large sample of redistributive experience is its political instability, which

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54. See Ascher, 1984, for an analytical narrative, albeit one largely concerned with the politics rather than the economics.

has meant that each episode has been fairly short-lived and hence that little evidence of where and how a more consistent, sustained, long-run effort might succeed or fail. In no single economic statistic does this difference in stability show up more clearly than in the inflation data for the four countries: over 1965-1988, 48% per annum on average for Peru, 84% for Chile, and 134% for Argentina, compared to 11% for South Africa.[55]

The instability of the South American countries and the fact that their redistributive efforts were so often short-lived -- and indeed often reversed by a subsequent reactionary regime -- mean that we get few lessons for South Africa of what might work. On the other hand, we do get much evidence of how policies can fail.[56] The principal lessons from that evidence are as follows.

1. Reliance on the existence of excess capacity to provide the resources to increase the welfare of the poor is misplaced. It is now well documented that a development strategy that forces import-substitution industrialization litters the industrial landscape with excess capacity, oligopolistic posturing, shortages of key factors, smaller domestic markets than expected, licensing of raw material imports, and X-inefficiency.[57] So it is always tempting to reformers to see the resources for redistribution emerging from expanded use of already installed capacity. Unfortunately, the very forces that created the excess capacity make it difficult to utilize that excess capacity without radically restructuring the entire economic system. And, given the limited political and bureaucratic capacity of governments, the primacy of concern with inequality precludes the overall restructuring necessary to rapidly expand industrial outputs.[58]

2. The absence of sound macroeconomic policy is disastrous. Attempts to redress inequality necessarily involve increased government spending. Unaccompanied by other changes, this means government deficits, inflation,

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55. These are for the GDP implicit deflator, and the figures given here are the compounded equivalent averages (Squire, 1991, pp. 178-179 and 246).

56. For a start into this literature, see Cline (1975), Foxley (1976), Behrman and Hanson (1979), Griffin and James (1981), Ascher (1984), and Moll (1990).

57. For those not versed in this literature, the classics are Little, Scitovsky, and Scott (1970), Balassa et al. (1971), Krueger (1978), Bhagwati (1978), and Krueger et al., (1981).

58. Where industrialists have been forewarned of the radical redistribution, capital may have been "mined" or inventories depleted, so that the excess capacity proves illusory. Or, where capitalists are positioned for continued resistence to the reforms, as in the Sandinista Nicaragua, utilizing capacity may be difficult to achieve. See Goldberg, 1991, pp. 2ff.

balance-of-payments deficits, and foreign-exchange-rate devaluation. This by itself plays into the political hands of the anti-reformist groups. But it also has many serious effects on the reforms that are being undertaken, two of which must be noted here. One, the decision to increase government expenditure without increasing government taxation is usually taken to avoid confrontations with the wealthy, for fear that investment will diminish or capital flight expand. But the inflations and devaluations that ensue produce the growth of uncertainty and controls that bring about this very result. Increased aggregate demand along with stagnant output and declining investment eventually produces an intolerable macroeconomic crisis. And two, as inflation and devaluation occupy more and more of the government's energies, and the search for ways to reduce the government budgetary deficit and the balance-of-payments deficit intensifies, the policies that were introduced to address inequality may be retrenched or even abandoned, explicitly to save expenditure or implicitly by freezing nominal levels of spending. The positive lesson from this experience is that models that link the macro and the micro are needed for evaluating redistributive policy in South Africa; and these models will differ from the usual advanced-country models in their heavy concern for the wage-price-output nexus, the foreign sector, and the link between the government budget and the balance of payments (Behrman and Hanson, 1979, p. xvi and passim).

3. Policies that have easily achievable and desirable short-run effects on distribution often have undesirable long-run effects. Given the supply-side inelasticities and the macroeconomic dangers, an appetizing policy for a reformist government is one that directly reaches the poor without requiring government resources. These are easy to find: higher minimum wages, mandated employment increases (usually in parastatals or off-budget state-owned-enterprises), price controls on necessities, nationalization of large and profitable private (and often foreign-owned) enterprises, compulsory procurement and distribution of basic goods, legalization of "squatting", rural credit on soft terms, etc. In each of these efforts to get something (to redistribute) for nothing, the long-run (and sometimes not-so-long-run) consequences are supply reductions.[59] The dilemma is clear, though no more

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59. The case is somewhat more complicated than "mere" supply reductions in the case of state-owned enterprises. Increased employment there that is not productivity-enhancing will end up either as increased prices, as reduced quality of service, or as a further drain on the government budget.

easily resolved for its clarity. Redistribution with government spending makes demand run ahead of supply; redistribution without the government spending makes supply run behind demand.

4. It is easy to reach the not-so-poor and hard to reach the extremely poor with redistributive policies. In middle-income countries, the very poor are the landless peasants, the unemployed, and the urban informal-sector operators. Government policy rarely impinges directly on any of these people -- indeed, the very definition of the "informal sector" is that it operates outside the purview of the state. Many of the usual redistributive measures fail to directly reach these groups, being targeted rather at the urban population and the employed, "modern-sector" workers. Other policies, despite being well-intended, end up reaching the not-so-poor -- new supplies of rural credit, for example, are most easily attained by those who already have land, collateral, and ongoing productive operations. Finally, the indirect effects of redistributive policies can even be negative on the truly disadvantaged. Strong minimum wage legislation, for example, may reduce modern-sector employment, thereby increasing unemployment and reducing the wage rates in rural and informal-sector labor markets.[60]

5. Single-minded concern for the direct effects of redistributive policies means that damaging indirect effects may undo them. Economists earn livings pointing out that the indirect effects of policies often undermine the direct; politicians earn reelection ignoring these indirect effects. In redistributive policies, the indirect effects are legion. The indirect effects of government deficits have been mentioned; so also the supply-side effects of pro-poor regulation of the operation of private entities. Asset redistribution also generates indirect effects. With renewable assets, the process of redistribution can, in theory, be once-and-for-all with no further secondary impact than those inevitably -- and desirably -- associated with income and wealth effects. But, in practice, redistribution creates expectations of, or at least worries about, further redistribution. This in turn too often leads to disinvestment and capital flight, the former with

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60. An increase in unemployment is doubly stimulated, both by the direct effect on employment in the affected firms and by any new rural-urban migration stimulated by the lure of higher wage rates (Todaro, 1969).

growth effects and the latter with balance-of-payments effects.[61] Land reform is another kind of asset redistribution, seemingly immune to the indirect effects of real deterioration of investment by land's immutability. In the absence of technical assistance, loans for capital equipment, and provision of intermediate inputs, however, there is no assurance that a land reform will augment agricultural output, much less provide a reasonable standard of living for the newly enfranchised tenants.

A closer look at Chile under Salvador Allende, 1970-1973, lends specificity to these general warnings from Latin America.[62] Allende's hope for radical transformation of the economy was troubled from the start by the political and economic situation -- Allende himself had been elected by plurality, his party did not control the Congress, and the previous government had left a high inflation rate, a high foreign debt, and a low growth rate. Nevertheless, Allende and his government launched their program, in the hope that raising the incomes of the poor would increase aggregate demand, output, and employment without worsening inflation or foreign debt.

Allende's redistributive plan was based on four policies: 1) land reform; 2) nationalization; 3) wage policy; and 4) increased government spending aimed at the poor. Since each of these policies is a prime candidate for emphasis in a majority-ruled South Africa, it is instructive to trace the implementation and outcome of each.

Land Reform. Although less than one third of Chile's population was involved in agriculture, two thirds of the poor resided there. This made agriculture the place where policy could reach the most poor people. Unfortunately for Allende's plans, his political weakness forced him to work within the existing laws, which restricted expropriation of land to estates that were abandoned, badly run, or excessive in size. Expropriated land was farmed initially as a collective, with members also having private plots; ultimately, the members were to decide whether to continue the collective

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61. There is much confusion about these processes, arising in a failure to distinguish real and monetary variables. If disinvestment simply means ownership divestiture, then the real capital remains, with little impact on production (unless there is a concomitant loss of management skills and information about technological change). Capital flight can be contained by means of dual exchange rates and taxation of capital export, but the price of course is further distortion of capital markets. The serious real worry is that real net investment will decline.

62. See Crowfoot, 1991; De Vylder, 1974; Foxley, 1976; Foxley, Aninat, and Arellano, 1979; and Nove, 1976.

arrangement or further divide the land into private plots. Problems emerged on several fronts: 1) the expropriated land-owners released the poorest of their lands and removed much of the capital equipment from it; 2) the rural poor were dichotomized into those who attained new land and those (non-members) whose work opportunities were reduced; 3) members, guaranteed high incomes, often shirked their collective labor obligations or hired low-wage substitutes from non-member groups in order to work on their own plots; 4) price distortions were introduced, especially after a state monopoly of agricultural marketing was created, and these in turn distorted production decisions; and 5) efforts to recapitalize the expropriated land were not coordinated with financing arrangements, driver training, and spare part provision. In the end, the land reform had but small effect on either output or equity.

Nationalization. In the decades after World War II, copper comprised one third of Chile's exports, and nearly all of Chile's copper mines were owned by foreign companies. By 1970, Frei had already negotiated a partial transfer of ownership and control to the Chilean government, but Allende wanted to go much further, using the profits of the copper and other major industries to finance his social programs. Between 1970 and 1973, the government-owned "Area of Social Property" (ASP) increased its control of Chile's total industrial assets from less than one third to more than two thirds. While wages grew no faster in ASP than in the private sector, employment did, affecting costs there; and price controls on necessities created supply imbalances and reduced revenues in ASP companies. The result was ASP deficits -- not the surpluses to finance social programs that had been hoped for -- with the inevitable subsidies and money supply increases. Internationally, the nationalization of the copper mines led to reduced U.S. foreign aid and an "invisible blockade" of imports into Chile of certain intermediate inputs and consumer goods, reducing the benefits to Chile of the increased ownership share.

Wage Policy. Periodic wage increases had long been common in Chile to compensate for the inflation. And Allende's policy was not so much to accelerate these wage increases as to implement price controls on necessities in an effort to raise real wages. Inevitably, these controls led to output reductions in the very products needed to sustain the increased real wages.

Increased Government Spending. Allende did increase public spending directed at the poor, particularly in urban housing. And this, through multiplier effects, in turn raised private consumption as well. Despite the excess capacity in industry and the excess potential in agriculture, outputs responded little in either sector, which meant that the increased consumption led to reduced inventories, added imports, and increased government deficits. Allende's political opposition prevented the increase in taxation that might have provided the resources for his redistributive policies, and the end result was renewed and accelerated inflation. As the rich developed defense mechanisms, the "inflationary tax" fell increasingly on the very groups policy had intended to benefit.

Allende's redistributive efforts in Chile were short-lived. But not without one important legacy. Perhaps nowhere else in recent history does one get a more concise and clear picture of how good redistributive intentions can go awry.

Conclusions

Haste makes waste, or worse. Redistributive efforts go most often awry from being implemented too quickly, without sufficient attention to the details and indirect effects of the policies and without sufficient care for the adequacy of the resources available for their implementation. The macroeconomic maelstrom into which these efforts so often descend is powered by growing government spending in an environment where output in general, or the government's control of that output, is diminishing.

It is easy, of course, to recommend better policy if one ignores the political reality of these efforts. Between getting and spending, it is easier to spend. Governments making redistributive efforts have been elected by the poor, and the poor expect prompt and extensive improvements in their welfare. Planning takes time that the government may not feel it has available. The hope that resources will appear from underutilized pools of excess capacity has been regularly disappointed; and the rich, if on the defensive, generally have sufficient hold on the economy to thwart and distort the growth that might make new resources available.

If South Africa can learn one basic lesson from these prior experiences, it is that redistribution ultimately requires growth and attention to macroeconomic policy. Short-run measures to alleviate the worst of the inherited poverty can be undertaken, but they must be responsibly budgeted and targeted only at the very poor. And they must not be allowed to take priority from the long-run measures that will gradually make all the citizens of South Africa more productively equal.

V. Implications for United States Policy

The United States has always had a special connection to South Africa. It begins with a common background as a British colony, and it has grown through a common concern with communism during the Cold War decades. Now, the common interest becomes our mutual determination to develop a just, equitable, multiracial society. It is unfortunate that American economic history since 1865 does not offer more positive lessons for South Africa in its search for ways to redress the inequality inherited from a century of apartheid, but we can at least offer enthusiastic support for the promising efforts the majority-ruled South Africa plans to undertake. Indeed, we may even learn from South Africa's efforts.

Our policy support can run along two lines, separately and simultaneously. The first is the provision of resources to aid promising policy, and the second is the discouragement of short-sighted and counterproductive policy.

A fully democratic South Africa will want to devote resources in three directions, and United States assistance may further each:

1. The immediate provision of basic social services to the very poor. These include -- among a longer possible list -- medical services, public health amenities, and threshold living standards with respect to food, clothing, and housing. The demands for these will be insatiable once the poor vote. United States help in this effort will be useful, visible, and praiseworthy. But it should be considered always within the confines of two concerns. One, these short-run expenditures, for all their political and humanitarian value, will deflect expenditures

from the ultimately necessary devotion of resources to growth, and the United States should insist that the amount of resources so deflected be moderate and sensible. And two, history suggests that it is simpler administratively and more rewarding politically to bunch these social service expenditures in the towns and cities, where the population is dense and audible; but the really poor, in South Africa as elsewhere on much of this globe, live in the countryside, and United States assistance will ease the problems of South Africa's politicians if it is targeted into the rural areas.

2. The expansion of education for the nonwhite population, especially at the primary and secondary levels. To some extent, the greater provision of education is like the greater production of any output in that it requires the new input of scarce resources. But the expansion of nonwhite education in South Africa faces another, and potentially more serious, problem -- the pace of the expansion may be constrained by the need always for prior expansion of student output to satisfy the need for new teachers for the new students. This can pose a dilemma for South African politicians. Either the expansion is slow and the student output of undiminished quality, or a rapid expansion is made possible by reducing the qualifications of the teachers and hence the quality of the student output. The United States may be able to reduce the magnitude of this dilemma either through the direct provision of teachers for primary and secondary schools -- at the professional or Peace Corps level -- or through the provision of assistance to the nonwhite teacher-training colleges and programs. The latter, much the cheaper in terms of United States resources, may also be the more helpful in terms of assuring the high quality of the expanded nonwhite educational system.

3. The augmentation of the agricultural output and rural income of the black population. There are two parts to this augmentation -- blacks must get more land and they must be shown how to farm it productively. The United States can play a role in each aspect of the process. First, the highly inequitable distribution of land ownership needs to be redressed. The sooner the better, although redistribution without confiscation can be expensive. Since there are many good reasons for wanting to discourage either confiscation or delayed redistribution, the

international community may choose to become involved in the redistribution and compensation process. This assistance could take the form of loans, rather than strictly donations, but the United States must take care not to remove the fruits of the redistribution while making the redistribution possible. Certainly, very soft loans would be required if this path were chosen. And the second part of the process of augmenting agricultural output lies in the research and extension needed to make small, peasant agriculture productive. While the extension work itself will have to be South African, the research into crops and techniques and the training of agricultural extension agents are areas in which the United States has great capacity and a successful history.

All the above involve resource transfers from the United States to South Africa, and the amount of this assistance will depend upon the importance a fully democratic South Africa assumes for United States foreign policy. But the United States can also, and with less cost, use its influence to discourage the adoption in South Africa of shortsighted and counterproductive policies. I will not list again the lessons we have learned from other countries, but the United States can make sure that South Africa is aware of them. We can take advantage of our special relationship with South Africa, as a partner state in the search for an equitable multiracial society, to press the policy dialog. This dialog will of course take place largely at the government-to-government and diplomatic level, but it would be greatly enhanced by a program of exchanges between government officials (other than diplomats), graduate students, and university faculty so that a continuing discussion of the merits and shortcomings of the past, ongoing, and proposed policies for racial redress in each of the countries can be facilitated. Macroeconomic stability is a necessary condition for the process, but it is not sufficient -- sensible growth and redistribution policies are also needed. Here too, dialog may teach us as well as South Africa.

A final word is called for on sanctions. Added to the internal contradictions of apartheid, detected by many before sanctions became a critical factor, sanctions have played an important role in the recent change in the white South African polity's attitude toward apartheid. Slow as they are, sanctions <u>do</u> work. But they have created great distortions in the South

African economy. Its rapid future growth -- so necessary for any hope of rapidly redressing inequality -- requires an outward-looking economic orientation in South Africa that cannot even be contemplated until sanctions, and any threat of their reapplication, are removed. Perhaps the most important single United States policy move in the economic sphere will be the lifting of trade and investment sanctions as soon as the political climate, in both countries, makes it possible.

Appendix A: The Model Used in the Educational Simulations of Section II

The dynamic problems of the growth of the educational sector can be examined through the use of a variant of the one-sector Harrod-Domar growth model. In this model, at any point in time, the capacity level of output is proportionally related to the quantity of capital available.

In this model, capital is faculty and output is student graduates. The current level of student output will influence future periods through what is essentially a saving and investment function. The saving function will determine the fraction of the student-output -- namely of graduating students from various levels of the educational system -- that will be employed as teachers in future periods. Depreciation refers to the reduction of any period's faculty-capital stock due to retirement and death. The output from every level of schooling is affected by the relevant drop-out rates. What is taken as exogenous to the model, in addition to the starting data for enrollments and faculty, is the growth rate of the school-age population.

The evaluation of the South African educational sector for nonwhites, both in its present state and under various possible alternative scenarios, was performed with the following model (with each of the variables being defined after the equation in which it is first used).

$$(A.1) \qquad Y_{1t} = b_1 Y_{0(t-1)} \ ,$$

where $Y_{0(t-1)}$ is the number of students starting primary school in period t, Y_{1t} is the number of students completing primary school in period t, and b_1 is the fraction of students starting primary school who complete it.[63] For nonwhites in South Africa, Y_{0t} is currently far below the number of school-age students; it is the time that it will take to get the primary school enrollments up to the population at that age that is the concern of the simulations we will conduct.

$$(A.2) \qquad Y_{2t} = b_2 Y_{1(t-1)} \ ,$$

where Y_{2t} is the number of students completing secondary school in period t, and b_2 is the fraction of students completing primary school who go on to enter and complete secondary school. Equation (A.2) may also be written as

$$(A.3) \qquad Y_{2t} = mb_2 Y_{1(t-1)} + (1-m)b_2 Y_{1(t-1)} \ ,$$

where m is the fraction of the students completing the secondary level who earn matriculation.[64]

$$(A.4) \qquad Y_{3t} = b_3 m Y_{2(t-1)} \ ,$$

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63. Levels 1, 2, and 3 refer to the primary, secondary and tertiary levels of schooling, the only three levels of disaggregation of students with which we shall be concerned here.

64. Thus, the students leaving secondary schooling are separated in the two righthand-side terms of equation (A.3) into the fraction, m, who matriculate and the fraction, (1-m), who do not.

where Y_{3t} is the number of students completing tertiary education in period t, and b_3 is the fraction of matriculated secondary students who start and complete the tertiary level.

$$(A.5) \qquad I_{2t} = c_1(1-m)Y_{2(t-1)} + c_2mY_{2(t-1)} \quad ,$$

where I_{it} is the number of secondary level graduates who become school instructors in period t, c_1 is the fraction of students completing secondary without matriculation who become instructors, and c_2 is the fraction of students completing secondary with matriculation who become instructors.

$$(A.6) \qquad I_{3t} = c_3Y_{3(t-1)} \quad ,$$

where c_3 is the fraction of the students completing tertiary who become instructors.

$$(A.7) \qquad K_{1t} = (1-d)K_{1(t-1)} + g(I_{2t} + I_{3t}) \quad \text{and}$$

$$(A.8) \qquad K_{2t} = (1-d)K_{2(t-1)} + (1-g)(I_{2t} + I_{3t}) \quad ,$$

where K_{it} is the available faculty (i.e. stock of teaching capital) at level i in period t, d is the depletion rate of the existing stock of teachers, and g is the fraction of the newly generated teachers who become employed in the primary sector.[65]

$$(A.9) \qquad Y_{it} = fK_{it} \quad ,$$

where f is the average student-teacher ratio in the nonwhite schooling sector.[66]

Data are derived from Republic of South Africa, various years, and South African Institute of Race Relations, various years. The rate of nonwhite population growth is currently 2.8%. The current rate of growth in the number of teachers available to the nonwhite sector is 4.5%. The proportion of students completing the primary and secondary levels of education was determined from the number of students currently being carried over from each year of schooling to the next.[67] The fraction of nonwhites leaving the secondary level with their matriculation certificate was 62% in 1987 (versus 95% for whites). These are the values employed in the projections of the text, but it should be noted that at the time of their publication, government inquiries were being considered to evaluate the abnormally low pass rates of nonwhites. Thus potential policy changes in this area present an opportunity for divergence between the predicted and actual trends of the future. The initial estimate of the proportion of nonwhite school-age children not attending school is approximately 40%. This was derived from the difference between the estimated ratio of the nonwhite school-age population to the total

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65. The rest, a fraction (1-g), enter the secondary sector.

66. For simplicity, f is assumed identical at both level one and two of schooling. And excess capacity is ignored, not implausibly as the simulations will shortly show.

67. This is not the same thing as the tracking of cohorts, which in effect uses grade-completion data from earlier years. Here we develop a hypothetical cohort, which passes from year to year in the educational system at the current rate of success at each level. Given the rapid changes in the system, the use of the most recent data seems sensible.

nonwhite population and the number of students enrolled in 1987, the base year.

Appendix B: The Model Used in the Agricultural Simulations of Section II

The agricultural simulations start with a single, relatively simple constant-elasticity-of-substitution (CES) production function for each of the two sectors,

$$(B.1) \qquad Q_i = A_i\{B_i[(K_i)^{C_i}(T_i)^{1-C_i}]^{-D_i}+(1-B_i)(L_i)^{-D_i}\}^{-1/D_i} \quad ,$$

where i = the relevant agricultural sector (w for "white", h for "homelands"), Q_i = gross agricultural output in millions of 1985 Rands, K_i = agricultural capital also in millions of 1985 Rands, T_i = land in thousands of hectares, L_i = labor in thousands of worker-years, and A_i, B_i, C_i, and D_i represent the usual four parameters of the CES production function.[68]

The first step is to find plausible values for the parameters of the two production functions (i.e. the eight A, B, C, and D parameters) for some recent year. There are data for 1985 on the values of Q, T, and L in each of the two sectors.[69] The values of K are estimated.[70] The "homelands" agricultural sector uses 16% of the land, employs 79% of the labor, has 1% of the capital, and produces 2% of the output of the two agricultural sectors together.

The information on Q, K, T, and L is sufficient to determine only one of the four parameters of each production function. Four other sources are tapped for completion of the calibration of the model. One, the total wage bill of "white" agriculture, together with the assumption that wages are competitive there, is utilized.[71] Two, the value of the elasticity of substitution in each of the production functions is assumed to be either 0.5 or 2.0.[72] Three, the competitive capital share of "white" agricultural output is assumed to be either 0.2 or 0.3. And four, the marginal product of capital in the capital-scarce "homelands" (MPK_h) is assumed to be two or three times that of the "white" agricultural sector. These sixteen permutations of assumptions (i.e. two to the fourth power) yield sixteen different sets of parameter values for the production functions, and each of the sixteen is examined in each of the simulations reported below.

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68. Note that K_i and T_i are clustered together in a Cobb-Douglas production function to facilitate the calibrations of the functions. The parameter D_i is related to the (assumed constant) elasticity of substitution by the equation, CES=1/(1+D).

69. The measure of Q is unambiguous; T is cultivated land, a smaller figure than either arable land or total land; L is permanent laborers -- harvest and squatter labor on "white" farms is omitted, and many may be counted as economically active agricultural labor in the "homelands" who are in fact merely dependents.

70. For the "white" sector, each year's real private agricultural investment is cumulated, with allowance (8% per annum) for depreciation. This omits public investment, both agricultural and nonagricultural, that essentially provides capital to "white" farms. The value of K for the "homelands" is quite unknown, though small. Here it is arbitrarily assumed to be equal to 1% of the capital in "white" agriculture.

71. The assumption of competition means that the wage rate equals the (value of the) marginal product of labor in the "white" sector (MPL_w), and hence the total wage bill equals L_w*MPL_w. This is 22% of Q_w. The fact that some of these wages go to white agricultural workers (less than 3% of the total) is ignored.

72. This means D values of +1.0 or -0.5, respectively.

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