ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8672

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Final Draft

MASSACHUSETTS

The Financial Implications of Divestiture
Prepared by Franklin Research

In late December 1982, outgoing Governor Edward King vetoed a bill that would have made Massachusetts the first state to completely divest its pension funds from corporations with affiliates or subsidiaries in South Africa. The Governor, while publicly supporting the intent of the legislation, cited a State Treasurer's Office estimate that the bill would decrease the value of the State's Pension Funds by over $16 million as the rationale for casting his veto. This note will show that when the Massachusetts legislature overrode the Governor's veto 133 to 2 in the House and 23-5 in the Senate, the value of the State's Pension Funds actually increased.

When one purchases a bond, one receives a fixed annual return ('the coupon') plus a pledge from the company that they will pay you $1,000 for each bond you hold at some specified time in the future ('the maturity date'). For example, the owner of a bond which has an 8% coupon and matures in 20 years would receive $80 in coupon payments for each of the next 20 years plus $1,000 when the bond reaches maturity. When interest rates rise, bond prices fall. This occurs because investors place less value on a fixed annual income stream if higher returns can be earned by investing in some other instrument (such as money markets or T-Bills). Correspondingly, when interest rates fall, bond prices rise because investors are now willing to pay more for a fixed annual income stream.

Massachusetts State Pension Funds purchased many bonds in the 1960's and early 1970's when interest rates were low. In the early

1980's when interest rates skyrocketed, bond prices plummeted. Accordingly, by December 1982 the market value of the State Pension Funds bond portfolio had significantly decreased. The Treasurer's Office, however, in their analysis presented to the Governor, did not use December 1982 market prices for bonds. Instead the 'maturity' value ($1,000 per bond) that the State's bonds would be worth 20 to 30 years in the future was used to calculate the current value of the State's bond portfolio! The Treasurer's Office $16 million-plus deficit was achieved by subtracting the current December 1982 market value of the State's Bond portfolio from the value that these bonds would achieve when they reach maturity in the future.

Three days after the Governor had vetoed the bill, the State Treasurer's Office admitted, after being pressured by several citizen-economists, that 1) the $16 million-plus drop in the worth of the State Pension Funds Bond portfolio had already taken place and was not due in any respect whatsoever to the South African Divestiture legislation; and 2) through a series of "bond swaps" no financial losses would be incurred by the State Pension Funds. "Bond Swaps" in this case would mean the simultaneous selling of bonds in corporations with South African connections and the purchasing of other bonds on the State's "Approved Purchase List" that did not operate in South Africa.

An example of a bond swap available to the Massachusetts Public Employee Pension Funds would be to sell Minnesota Mining and Materials ("3M") bonds and to use the proceeds to purchase Texas Instruments ("TI") bonds. 3M Corporation's South African subsidiary extracts

and markets South Africa's strategic and lucrative diamond, gold, silver and uranium mines. TI has no South African connections and is on the state's "Approved Purchase List."

On December 23, 1983, Massachusetts Public Employee Pension Funds owned 1,000 3M bonds. These bonds had an annual coupon of 8.85%, matured in 2005 and were priced at $812.50 each. Thus, each 3M bond yielded $88.55 a year and would be worth $1,000 in the year 2005. If sold on December 23, 1982, these 1,000 3M bonds would fetch $812,500. (There are no brokerage commissions incurred when buying or selling bonds.)

On December 23, 1983, "TI" bonds matured in 2005, yielded a coupon of 12.7% and sold for $1,032 each. The $812,500 the state could obtain from selling its 1,000 3M bonds could purchase 787 TI bonds ($812,500 ÷ $1,032 = 787). These TI bonds would provide an annual yield of $99,949 and would be worth $787,000 in the year 2005. As Table 1, Columns A-C show, such a bond swap would increase the state's Pension Funds value by over $50,000.

But this guaranteed $50,000 gain significantly understates the increased value that would occur due to a 3M-TI bond swap. Each year from 1983 to 2005 the TI bonds would yield $11,449 more than the 3M bonds. This extra money could be reinvested. Column D shows that the value of this bond swap would increase by $483,484 if a conservative 8% nominal reinvestment rate is assumed.

The above analysis may cause you to ask why anyone would buy 3M bonds if TI bonds offer a higher rate of return. The answer is taxes. As mentioned earlier, bonds yield two types of return--an

TABLE 1

	(A) 3M	(B) Texas Instr.	(C) gain(loss) obtained via bond swap	(D) change in value in 2005 dollars***
1983	$88,300	$99,949	$ 11,449	$ 62,189
1984	88,300	99,949	11,449	57,582
1985	88,300	99,949	11,449	53,317
1986	88,300	99,949	11,449	49,367
1987	88,300	99,949	11,449	45,710
1988	88,300	99,949	11,449	42,325
1989	88,300	99,949	11,449	39,189
1990	88,300	99,949	11,449	36,286
1991	88,300	99,949	11,449	33,398
1992	88,300	99,949	11,449	31,109
1993	88,300	99,949	11,449	28,805
1994	88,300	99,949	11,449	26,671
1995	88,300	99,949	11,449	24,695
1996	88,300	99,949	11,449	22,866
1997	88,300	99,949	11,449	21,172
1998	88,300	99,949	11,449	19,604
1999	88,300	99,949	11,449	18,152
2000	88,300	99,949	11,449	16,807
2001	88,300	99,949	11,449	15,526
2002	88,300	99,949	11,449	14,409
2003	88,300	99,949	11,449	13,342
2004	88,300	99,949	11,449	12,354
2005	88,300	99,949	11,449	11,439
Value at Maturity in 2005	$1,000,000	$787,000	$(213,000)	$(213,000)
Total	$3,035,500	$3,085,827	$50,327	+ 483,483

*** Assumes conservative 8% nominal discount rate. Between 1980 and 1982 the nominal discount rate exceeded 13%.

annual coupon dividend and a lump sum payment of $1,000 when the bond reaches maturity. The coupon income is taxed at the normal tax rate (over 50% for individuals and corporations in the highest tax brackets). Any appreciation in the value of the bond obtained when it reaches maturity is taxed at the much lower long-term capital gains tax rate (only 20%). Taxpaying entities therefore pay a premium for deep-discounted bonds due to the fact that a larger proportion of the income they receive from the bond is taxed at the lower long-term capital gains rate. In the above cited 3M and TI example, 3M bonds offer $187,500 in long-term capital gains, while TI provides a long-term loss of $25,500. The Massachusetts Pension Funds are, however, tax-exempt institutions. They derive no extra benefit from owning deep-discounted bonds. Accordingly, it would make economic sense for the Massachusetts Pension Funds to sell their deep-discounted bonds that taxpaying entities are willing to pay a premium for, and to use the proceeds for non-discounted bonds that have no tax shielding attributes. Making such swaps is called arbitrage, and is a standard practice used by all reputable financial advisors.

The Massachusetts Treasurer's Office claimed that such bond swaps could not be implemented because of a non-binding, non-public Treasury Department regulation that no bond could be sold for less than was paid for it, unless all of the deficit could be recouped in 10 (or less) years' time by increased coupon payments. Since most of the state Pension Funds bonds have over 20 years to go before reaching maturity and are selling well below par, the Treasurer's Office claimed that they were legally prohibited from making financially advantageous bond swaps.

This Treasury Department non-binding rule was instituted years before when interest rates were low and not volatile. A dozen senior financial analysts and Harvard Business School professors I contacted could provide no rationale for this non-binding rule. Neither could officials from the Treasury Department.

The Massachusetts South African divestiture bill superceded this Treasury Department's non-binding rule. It thus enabled the state Pension Funds to take advantage of arbitrage on one-third of its $125 million dollar bond portfolio. By 2005, these bond swaps should increase the value of the state's Pension Funds by at least $5 million, and perhaps much more. Perhaps one day this Treasury Department non-binding, non-public archaic rule will be overturned for the remaining two-thirds of the state's Pension Funds bond holdings that are not invested in corporations that do not profit from apartheid. If this occurs soon, the state Pension Fund's value will increase by at least another $5 million.

Combined holdings of State Employees' and Teachers' pension funds in South Africa related companies and banks (paper loss or gain calculated as of Nov. 30, 1982)

Industrial Bond	Book Value	Current Market Value	Loss or (Gain)
Abbott Labs	$2,131,500	$1,472,625	
Borden, Inc.	200,500	152,000	
Caterpillar Tractor	1,650,250	1,255,000	
Dow Chemical	3,382,609	2,537,690	
Exxon Pipeline	2,173,800	1,800,000	
Ford Motor Co.	3,736,943	2,727,800	
General Electric Co.	1,300,000	1,072,500	
General Motors Acc. Corp.	(see bank bonds, below)		
Minnesota Mining & Manuf.	1,000,000	806,000	
Pfizer, Inc.	1,094,500	922,000	
Union Carbide	2,595,200	1,904,000	
Warner-Lambert	895,000	709,000	
Xerox	1,197,000	956,000	Industrial Bonds sub-
Bank Bond Sub-total=	21,357,302	16,596,365	total loss = $4,760,937
Bankamerica Corp.	6,769,302	5,138,275	
Bankers Trust	1,847,625	1,381,460	
Central National Bank of Cleve.	(sold or not on most recent list)		
Chemical Bank	4,522,915	3,346,440	
Citicorp	5,347,508	3,963,500	
Crocker National Bank	2,255,500	1,691,600	
First Pennsylvania Bank	482,900	268,400	
General Motors Acc. Corp.	3,073,771	2,434,500	
Manufacturers Hanover	5,116,473	5,079,936	
Wells Fargo Bank	2,000,000	1,709,500	Bank Bonds sub-total
Sub-total=	31,415,994	25,013,611	loss = $6,402,383
Bank Stocks			
Bankamerica Corp.	(sold)		
Citicorp	(sold)		
Citizens & Southern Nat'l Bank	(sold or not on most recent list)		
Continental Illinois	(sold since Aug.31)		
Crocker National Bank	(sold)		
Fidelcor	(sold)		
First Chicago Corp.	(sold)		
First City Bancorporation - Texas	(sold)		
First National Boston Corp.	5,442,259	8,128,125	
Harris Trust & Savings	(sold or not on most recent list)		
Manufacturers Hanover	(sold since Aug.31)		
Maryland National Bank	(sold since Aug.31)		
Mellon Bank	5,154,516	7,975,000	
Morgan, J.P. & Co.	7,728,063	11,347,500	
Northwest Bancorporation	6,698,280	5,600,725	
Philadelphia National Bank	(sold since Aug.31)		
Republic National Bank - Texas	5,969,000	6,900,000	
Security Pacific Corp	5,002,925	9,585,000	
Western Bancorporation*	(sold or not on most recent list)		
Sub-total=	35,995,043	49,536,350	Bank Stocks sub-total
Total =	$88,768,339	$91,146,350	gain = $13,541,307

*now First Interstate

Total net gain = $2,377,987

Business and Society Review Commentary

THE MASSACHUSETTS PORTFOLIO PURIFICATION

by MILT MOSKOWITZ

HOW DO YOU like this portfolio:

Stocks and Bonds	Market Value
Abbott Labs	$1.5 million
Dow Chemical	2.5 million
Ford Motor	2.7 million
Chemical Bank	3.3 million
Citicorp	3.9 million
Manufacturers Hanover	5.0 million
Mellon Bank	7.9 million
J.P. Morgan	11.3 million
Security Pacific	9.5 million

Not bad, huh? Well, the state of Massachusetts doesn't think so. It's in the process of selling out every one of these positions from its public employee pension funds. Some already may have been sold by the time you read this. During the last half of 1982 the funds also eliminated from their portfolios the securities of Bank of America, Citizens & Southern National Bank, Continental Illinois, Crocker National, Fidelcor and First Chicago. Among others ticketed to be sold, in addition to the ones listed above, are securities of Borden, Caterpillar Tractor, Exxon Pipeline, General Electric, General Motors Acceptance, 3M, Pfizer, Union Carbide, Warner-Lambert, Xerox, Bankers Trust, First Pennsylvania, Wells Fargo, Republic National Bank of Texas, and Northwest Bancorp.

It looks like a blue-chip clearout. What's going on here? This is very simply a portfolio purification. Every one of the companies named above has something to do with South Africa. The banks loan money there, often to the government itself. The industrial companies have subsidiaries there and/or sell their products there. Early in 1983 Massachusetts became the first state in the union to take the position that it did not want any public funds invested in the securities of companies which did business in a country "whose official government policy is based on a flagrant system of racist laws." The bill, passed by the legislature, directs that all stocks and bonds of companies involved in South Africa be sold within the next three years. Since it seemed clear in late 1982 that such legislation would pass, the pension funds began selling out these positions even before the bill passed, taking advantage of a rising stock market to pocket some profits.

The anti-apartheid action in Massachusetts was a victory for a broad-based coalition called Mass. Divest (Massachusetts Coalition for Divestment from South Africa). More than 100 labor, religious, and community organizations backed the campaign, among them the Massachusetts Federation of Teachers, the Greater Fall River Central Labor Council, the Massachusetts Council of Churches, the Brandeis Undergraduate Student Government, the Justice and Peace Office of the Sisters of Notre Dame, and the Irish Republican Club of Boston.

The argument frequently used against such divestment is that it would be ruinous financially. Mass. Divest effectively countered this argument by showing that even bonds on which the pension funds were showing a paper loss could be swapped for other depressed bonds without any financial sacrifice. For example, the funds held 1,000 3M bonds with a redemption value at maturity in 2005 of $1 million; the bonds paid 8.85 percent interest; their market value, as of December 22, 1982, was $812.50 each. Mass. Divest analyst John Gordon Weiss showed that with the $812,500 proceeds from the sale of the 3M bonds, the pension funds could purchase 787 Texas In-

Race Mixing Is Still Taboo

Segregation in Various State University Systems

	% Black		% Black
Alabama		**Maryland**	
University of Alabama	12.0	University of Maryland	7.7
Alabama State University	99.5	Morgan State University	92.1
Arkansas		**Mississippi**	
University of Arkansas	5.7	University of Mississippi	7.1
U of Ark. at Pine Bluff	84.8	Alcorn State University	96.9
Florida		**North Carolina**	
University of Florida	5.1	U of N.C. at Chapel Hill	8.4
Florida A & M University	89.8	Fayetteville State University	86.3
Georgia		**Tennessee**	
University of Georgia	4.5	University of Tennessee	13.0
Albany State University	94.3	Tennessee State University	72.6
Kentucky		**Texas**	
University of Kentucky	3.5	University of Texas	2.5
Kentucky State University	66.1	Prairie View A & M University	98.0
Louisiana		**Virginia**	
Louisiana State University	6.2	University of Virginia	7.2
Southern Universiy	93.0	Virginia State University	95.2

—*Chronicle of Higher Education*
December 15, 1982

strument bonds whose value at maturity in 2005 would be $786,925; that's considerably short of $1 million, but the Texas Instrument bonds have a 12.7 percent coupon, giving an annual yield of $99,939 (as against the 3M annual yield of $88,500); so the pension funds will come out all right in the end. Texas Instruments does not have operations in South Africa. (I did not ask whether it would if it could.)

The South African divestment bill sailed through the Massachusetts legislature but was vetoed by outgoing Governor Edward J. King; it was one of his last acts as governor. The legislature then overrode the veto. The vote to override in the Senate was 23-5. The vote to override in the House was 123-2. Senator Jack Backman, one of the sponsors of the legislation, said the vote "will send a strong message to the rulers of South Africa." It's also a strong message to U.S. corporations. □

PIZZA POWER

The American Society of Mechanical Engineers figures the U.S. could put a permanent space station in orbit for the same sum—$9 billion—that Americans spent on pizza in 1981.

—*The Wall Street Journal*
November 19, 1982

S. Rockefeller A

1979 COMMON STOCK SALES
MICHIGAN STATE UNIVERSITY PORTFOLIOS*

COMMON STOCK	NUMBER OF SHARES	PER SHARE SALE PRICE	2/8/00 PRICE PER SHARE	TOTAL PROCEEDS	2/8/00 HOLDING VALUE	SALE PROCEEDS MINUS 2/8/00 VALUE
American Tel. & Tel.	9,691	$50	$51	$ 562,070	$ 494,241	$ 67,817
Capital Holding	38,520	22	20	847,440	770,400	77,040
Citicorp	15,540	25	22	388,500	341,880	46,620
Coca Cola	11,700	40	34	471,200	400,520	70,680
Delta Airlines	9,750	39	37	380,250	360,750	19,500
Dow Chemical	22,700	26	39	590,200	885,300	(295,100)
Eastman Kodak	4,750	54	46	256,500	218,500	38,000
Exxon	19,260	56	66	1,079,000	1,271,600	(192,600)
Federated Dept. Stores	13,400	26	26	348,400	348,400	-0-
Ford	10,125	41	32	415,125	324,000	91,125
General Motors	5,052	50	53	360,416	310,156	50,260
Houghton Mifflin	23,605	33	33	778,965	778,965	-0-
Household Finance	17,603	17	17	299,251	299,215	-0-
IBM	13,706	70	67	959,420	918,302	41,118
Minnesota Minning & MFG	9,250	54	50	499,500	462,500	37,000
National Detroit Corp.	18,714	30	28	561,420	523,992	37,428
Northwest Airlines	13,300	28	27	372,400	359,100	13,300
PepsiCo	17,925	25	24	448,125	430,200	17,925
Polaroid	4,665	28	23	130,620	107,295	23,325
Procter Gamble	5,688	78	71	443,040	403,288	39,760
RCA	16,945	25	23	423,625	389,735	33,890
Sears Roebuck	4,488	18	17	79,288	74,888	4,488
Tampa Electric	16,343	18	15	294,174	245,145	49,029
Upjohn	13,350	43	48	547,858	640,888	(93,758)
Xerox	2,655	57	65	151,335	172,575	(21,248)
Weyerhaeuser	12,675	38	35	388,258	443,625	(63,375)
		TOTAL:		$12,875,492	$11,975,488	$ 188,892

* - U.S. Companies with subsidiaries in South Africa.

Albert Case Fund

Schedule B

1979 COMMON STOCK PURCHASES
MICHIGAN STATE UNIVERSITY PORTFOLIOS

COMMON STOCK	NUMBER OF SHARES	PER SHARE PUR. PRICE	2/0/00 PRICE PER SHARE	TOTAL COST	2/0/00 HOLDING VALUE	2/0/00 VALUE MINUS TOTAL CO
Air Products	17,600	$33	$40	$ 580,000	$ 704,000	$ 123,200
American Hospital Supply	6,500	29	33	188,500	214,500	26,000
Archer-Daniels-Midland	26,407	22	37	580,954	977,059	396,105
Atlantic Richfield	500	66	103	33,000	51,500	18,500
Burlington Northern	8,050	63	79	507,150	635,950	128,800
Champion International	21,100	25	26	527,500	548,600	21,100
Communications Satellite	13,300	44	41	585,200	545,300	(39,900)
CONOCO	24,900	35	56	871,500	1,394,400	522,900
Du Pont	11,250	40	40	540,000	450,000	(90,000)
General Signal	9,500	36	36	342,000	342,000	-0-
Gulf Oil	10,200	33	47	600,600	855,400	254,800
Hughes Tool	16,350	33	65	539,550	1,062,750	523,200
Liberty National Life	16,600	28	19	464,000	315,400	(148,600)
Panhandle Eastern Pipeline	11,950	47	66	561,650	788,700	227,050
Texas Eastern Corp.	4,000	59	74	203,200	355,200	72,000
		TOTAL:		$7,206,404	$9,240,759	$2,034,155

BUSINESS ENVIRONMENT RISK INFORMATION

SUMMARY OF REMARKS INTENDED FOR THE STATE OF CALIFORNIA, CONFERENCE ON INVESTMENT AND SOUTH AFRICA

by Mary McCarthy, Ph.D, Vice President Research
BUSINESS ENVIRONMENT RISK INFORMATION (BERI) S.A.

Background. BERI S.A. is a Geneva-based firm specializing in risk analysis for the international firm. The company has been in business since 1966 and has over five hundred clients in Europe, North America, and Asia. Fifty-five countries are monitored continually and forecasts are updated three times per year. Two separate panels are used to collect expert opinion: one is composed of businesspeople located around the world who rate operating conditions according to a set of fifteen criteria; the second is a panel of socio-political experts, many of whom are diplomats, who assess socio-political risks according to a set of internal and external factors. Both panels are approximately 70% non-United States based. BERI S.A. uses a third measure of risk which is a statistical model and is designed to assess a country's ability to allow remittances in hard currency.

Conclusions on South Africa. BERI S.A. feels that operational and socio-political problems will become more acute throughout the 1980s. Therefore, no long-term commitments in South Africa are recommended. The situation

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indicates a trade only, or a transaction by transaction,relationsip.

For firms currently operating in South Africa, BERI S.A. recommends that management:

* deemphasize South African operations and prepare to shift production elsewhere, if possible.
* protect industrial sites and personnel against violence.
* consider the costs of exclusion from other African markets because of the South African operations, and the costs and management difficulties of handling stockholders initiatives and adverse publicity from anti-apartheid advocacy groups.
* examine the possibility of an orderly withdrawal early in the decade to avoid financial losses.

Operational Risks

The Operations Risk Index is currently at moderate levels, but the panel forsees a decline to high risk within five years. Major factors are the increased cost of labor and interruptions to operations, which result from the growing militancy. Management will be able to do very little toward resolving industrial disputes as many will concern issues outside the workplace, such as housing, education, etc. Bureaucratic interference is another negative factor in this rating. Firms will be caught between militant labor movements and government pressure to resist black demands. Firms will also be constrained in the amount of information that can be relayed to home offices; the government is already using security laws to stem the flow of financial information. Added costs will be necessary to protect plant sites against deliberate attack by armed groups as well as spontaneous labor violence. South African law makes each company responsible for establishing adequate self-protection.

(Information on costs of security installations cannot be transmitted to the parent company under South African security laws.) Government interference is already substantial and will grow as tensions rise.

Socio-Political Risks

The major risks have an obvious cause: blacks, who represent 72% of the population, have no rights, land, or even citizenship. The whites are determined to resist any significant change; modifications being currently discussed are designed to increase and prolong control, rather than liberalize the system. The government must fight change from without as well as from within. Thus, a democratically-ruled Namibia will be delayed as long as possible. The aim of the government is destabilization of the rest of the region, particularly Mozambique, Angola, and Zimbabwe. Frequent military operations, most of a clandestine nature, will hinder economic growth and political cohesion in the entire region.

Within South Africa, the whites will retain control only as long as they remain united. BERI S.A. has developed a scenario in which this situation persists for about the next fifteen years. Afrikaners are becoming more educated, prosperous, and urbanized. Many no longer hold the "rule by divine right" philosopy. The Dutch Reformed Church is splitting. Afrikaner students are resisting military service and questioning traditional values. Those in power are as single-minded as ever, but the weakening of resolve is less than one generation away. The question remains of whether or not the whites can allow change at a pace sufficient to avoid violent upheaval. BERI S.A. concludes that present trends indicate that this is not probable; thus, while socio-political forces will not

produce conditions disastrous to business within the next five years, the situation is evolving in that direction.

The Political Risk Index panel rates South Africa in the prohibitive risk category with further deterioration in their +5 Years forecast.

Financial Risks

The R Factor rating (R is for "repatriation and remittances") has declined from low to moderate risk within the last eighteen months. Firms will have more difficulty remitting earnings during the next year as South African hard currency reserves are at minimum levels. Over the longer term, the country's financial position depends on the price and market for gold. The R Factor rating should improve slightly in 1984 as the worldwide economy improves. However, a number of countries which hold substantial gold reserves are incurring heavy hard currency debt and will attempt to sell off gold later in the decade in order to service their debts. This will depress the price considerably and will cause tremendous pressure on the rand. Socio-political tensions will be increasing in South Africa simultaneously, and capital flight will be substantial, causing government restrictions on divestment.

(A thorough analysis of this complicated issue is available in the FORCE report on South Africa; the 1983 report will be published in March, 1983 and the 1982 report, published in May, 1982, is still available. BERI S.A. also offers a special monitoring service which includes forecast statements and statistics and is intended for international lenders, including firms offering export credit.)

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An Analysis Of The Effects Of Divestment From South Africa Related Equities On The Michigan Retirement Systems' Stock Portfolios

For Governor Blanchard's Implementation Commission On South Africa Divestiture

By:
Dennis J. Grether
SEI Funds Evaluation Services
And
Robert B. Zevin
United States Trust Co. of Boston

With Assistance From
Gilbert L. Beebower, Jack M. Marco, Peter M. Michaels, Howard H. Pohl, Ron J. Surz of
SEI Funds Evaluation Services
And
Robert A. Lincoln, Lawrence J. Litvak and Heidi A. Soumerai
of United States Trust Co.

Table of Contents

I. EXECUTIVE SUMMARY

The combined equity portfolio had a value of $4.72 billion as of September 30, 1985. The stocks of companies doing business in or lending within South Africa and Namibia are 58% of the value of all the stocks in the five Michigan pension funds managed by the Treasurer.

Nevertheless the costs of divestment, phased over five years, are surprisingly small. Initial sales and reinvestments would cost about $5.5 million over five years. Increased trading costs due to divestment would become a little more than .05% of the portfolio on an annual basis. Impaired investment performance because of the divestment restrictions would amount to a little less than .04% on an annual basis. Increased costs of administration would be less than .003% annually.

Total annual costs will rise gradually over the divestment period and then remain constant at approximately .1% (one tenth of one percent) per annum. Using a 12.32% discount rate, the present value of all divestment costs over the first five years is approximately $16.1 million. A one time extra appropriation of this amount to the pension funds and the Investment Bureau would effectively "pay" for divesture.

II. INTRODUCTION

1. Purpose of the Study

On August 15, 1985, Governor James J. Blanchard isssued a ten point policy statement with respect to withdrawing the support of Michigan's public resources from the system of apartheid enforced by the government of the Republic of South Africa. The sixth point endorsed

> "the concept of legislation requiring phased divestiture by state-administered pension funds of securities of firms operating or investing in South Africa. This divestiture must take place in a manner which does not violate the State's fiduciary responsibilities to present and future pensioners. To this end I am directing that the State retain the services of consultants who can analyze our pension fund investments and illustrate means of protecting the security of our pensioners while implementing phased divestiture."

The ninth point of the statement announced Governor Blanchard's intention to appoint an Implementation Commission that would report on "the best means of implementing these policies." The Governor named eight persons to the Implementation Commission on October 11, 1985. The Commission selected the authors of this report as independent consultants to provide expert analysis of the probable cost of divestment[1] to five retirement funds managed by the State Treasurer's Bureau of Investments.[2] We have also been requested to consider the most appropriate and cost-efficient ways of interpreting and executing the divestment language in point six of Governor Blanchard's policy statement.

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1. We use "divestment" and "divestiture" synonymously to refer to the sale by an investor of a defined list of those securities issued by companies doing business in or lending to entities in South Africa. We reserve the word "disinvestment" for actions by those companies to liquidate or close their operations and investments in South Africa.
2. The five funds are the Michigan Public School Employees' Retirement System; State Employees' Retirement System; State Police Pension, Accident & Disability Fund; Judges' Retirement Fund; and Probate Judges' Retirement Fund.

Pursuant to our instructions from the Commission, this report provides an extensive analysis of the impact of divestment on the funds' equity portfolios, with only a brief review of the far less important potential costs for the fixed-income portfolios. We have also been instructed to construct all of our proposals and estimates on the assumption that present basic investment approaches would continue during and after any divestment. Sometimes we consider the potential increase or decrease in the costs of divestment that might result from imaginable modifications of existing investment strategy.

To the greatest extent possible we have attempted to keep the text of this report brief and readily accessible to those with no experience or expertise in the subjects covered. Extended listings, references, technical and mathematical derivations have all been placed in footnotes or appendices.

Appendix G computes the estimated costs of divesting only securities of those companies doing business in South Africa that have failed to sign the Sullivan Principles and earn one of the top two ratings for compliance with them. This definition of divestiture has been considered at the request of the Commission, although it differs from the specifications of Governor Blanchard's policy statement.

The balance of this Introduction considers how to define the list of divested companies; over what time period to divest; and how to achieve phased progress over that time period. In Section II we then discuss the effects of our divestment definition on the set of choices available to the Bureau of Investments as it manages the five funds.

Section III uses this information, and the definitions and assumptions presented below, to calculate the increase in transaction costs that might be caused by the securities sales that would be required by divestment and the continuing increased trading costs that might persist after divestment was accomplished. Section IV presents a calculation of the investment cost that could result from lost investment opportunities due to divestment. Section V considers any other costs and the total of all costs. In this Conclusion we also evaluate the potentials for error and bias in our data and assumptions.

2. Identifying What To Divest

We take "firms operating or investing in South Africa" to mean all firms that own all or part of a business that operates in South Africa or Namibia; or that conduct activities in those countries that involve the presence of employees; or that make specific investments in or loans to the South African government, its Parastatals or the South African and Namibian operations of businesses. There would be only two exceptions to these general rules: (1) a bank or other financial institution with outstanding loans to South African or Namibian entities but with an unambiguous present policy of making no additional loans or investments of these types; and (2) a company that has employees in South Africa and Namibia for the sole purpose of reporting the news.

These guidelines are designed to be a faithful interpretation of point number 6 in Governor Blanchard's policy statement. We believe that these principles also conform to those advocated by the American Committee on Africa, TransAfrica, various proponents of disinvestment and divestment within South Africa, and our understanding of the intention of the sponsors of the divestment bills in the Michigan Legislature.

The South Africa Review Service of the Investor Responsibility Research Center (IRRC) periodically publishes a list of American, Canadian and British firms with operations in Southern Africa as defined above (with companies present exclusively to cover the news listed separately).[3] The IRRC also polls the 100 largest banks and bank holding companies in the United States on their policy and practices in Southern Africa. This information is included in the periodic publications of complete lists. Directory Update provides quarterly information about actions by firms that would cause them to be added or removed from the list. If the Treasurer's office were a subscriber to the South Africa Review Service, it could also inquire directly about the current status of specific companies in the periods between Directory Updates.

For U.S. companies we believe that the IRRC list is more complete and accurate than any other available list and achieves as high a standard as is reasonably practical. The lists of Canadian and British companies are also superior to any available alternative; but they suffer from a much lower degree of cooperation from the companies being polled.

3. Anne Newman and Cathy Bowers, Foreign Investment in South Africa and Namibia, (Investor Responsibility Research Center, Inc./Suite 900/1319 F Street N.W./Washington DC, 20004). This directory was published in December, 1984. It contains the names of 284 U.S., 151 U.K. and 19 Canadian companies. A new version is scheduled for April, 1986.

The Treasurer's office has already purchased American Depository Receipts for the common stock of non-U.S. companies in the pension funds it manages. In order to minimize the impact of divestment on achievable risk and return, it will be advisable to actively consider additional foreign companies for inclusion. In addition to the IRRC lists, considerable information on many foreign companies' activities in Southern Africa is available from the United Nations.[4]

A current list of companies whose securities would be divested under the criteria discussed in this section appears in Appendix A. We have utilized this list to calculate all the results reported in this study on the impact of divestment.

3. The Timing of Divestment

The major sources of potential loss from divestment are the initial costs of transacting trades that are required solely to implement the divestiture policy; the continuing addition to transaction costs as a result of confining investments to South Africa free companies; and the costs of being restrained by the policy from making opportune investments. Initial transaction costs result from a mandated pace of divestment in excess of the ordinary rate of sales and repurchases out of the portfolio.

4. United Nations Economic and Social Council Commission on Transnational Corporations, Document E/C.10/1985/7, January 1985; Transnational Corporations/United Nations/New York, NY 10017.

The more prolonged the divestment process is, the less likely it is to require sales beyond those that would have taken place anyway. A slow process also postpones the full impact of any continuing transaction and opportunity costs associated with divestiture. However, the purposes of divestment are not fully served unless it does force sales that otherwise would not have taken place; unless some sales begin soon after the policy is adopted; and unless it leads to a position of complete divestiture within a socially meaningful period of time.

In any case we assume that a divestment policy would always prohibit new purchases of securities in any South Africa related firms. Consequently, for rapidly growing funds such as Michigan's, the continuing divestment costs of lost opportunities and transactions would start low but grow increasingly as divestment proceeds and new contributions need to be invested. Thus, the primary element of cost affected by the pace of divestment is the initial transaction cost component.

In Appendix B we provide details of our estimate that Michigan's South Africa related stocks would be sold at an average rate of 25% a year in the absence of a divestment policy.[5] Transaction costs will be increased to the extent that policy mandates sales (and consequent reinvestments) in excess of this normal rate. For each year added to the divestment timetable, initial transaction costs will be reduced by 25%. This is true no matter how long the divestment period already is, and how small the costs already are. However, very short time allotments may also mandate sales at inopportune times or under difficult circumstances, while long periods may allow a more efficient implementation.

As the divestment horizon is shortened the social [illegible] of divestment is increased while the potential investment costs are also increased. We can quantify the estimated rate at which probable transaction costs are changed. We venture to suppose that full divestment in five years, with a required schedule for interim progress, would satisfy a preponderance of the social objectives of divestment.

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5. This does not mean that all the South Africa related securities would ordinarily be sold in four years. Each year, on average, Michigan would sell 25% of whatever it still owned. Thus, after four years, there would remain 75% X 75% X 75% X 75% = 31.6% of the original holdings.

We recommend establishing a schedule for divestment by requiring the Treasurer to sell South Africa related stocks each year with a value equal to 20% of the value of all such stocks held at the beginning of the year. This requirement would be in addition to the mandate that all South Africa related equities be eliminated by the end of five years. Under these rules, the additional transactions mandated by divestment would be less than one-quarter of those required by immediate divestment and would be spread over five years besides. Moreover, this timetable should permit the Treasurer to carry out the mandated trades in a well-timed fashion. Additional details and supporting calculations are presented in Appendix B.

In this study we have calculated the effects of divestment as if it were carried out over five years according to our recommended schedule.

4. Other Rules and Assumptions for the Divestment Process

We have based our analysis on the portfolio holdings and market conditions that prevailed on September 30, 1985. However, the list of companies assumed to be divested, which appears in Appendix A, has been updated through early December, 1985. Our chosen date was the end of the fiscal year for all five pension plans considered here. In addition, it is the most recent date for which detailed portfolio characteristics and cumulative historical statistics are available.

On the basis of conversations with Barry Stevens, the chief equity officer in the Bureau of Investments, we have assumed that present investment policy requires minimum stock positions equal to .5% of the equity portfolio values and maximum positions no greater than 5% of the market capitalization of the company owned. Thus the universe of security selection is limited to companies with market capitalizations over $500 million, since the five equity portfolios are worth over $5 billion.[6]

In fact, the rapid growth of the portfolios relative to the market capitalization of the entire U.S. stock market, has caused the Investment Bureau to increase the number of holdings and decrease the minimum investment relative to the size of the portfolios. We assume that this process will continue because of rapid growth and would be further accelerated by divestment. However, we also assume that investment attention would continue to be limited to companies with equity market capitalizations equivalent to a present $500 million or more.

For purposes of calculation we ignore the probability that companies that would now be targets for divestment will leave South Africa in the future and again qualify for investment. At the same time, we terminate the calculation of expenses of divestment ten years into the future.

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6. One-half percent of $5 billion is $25 million, which is 5% of $500 million. The effective minimun capitalization number will always be 10% (.5%/5%) of the value of the equity portfolio.

II. THE EFFECTS OF DIVESTMENT ON THE SET OF INVESTMENT CHOICES

METHODOLOGY AND RESULTS

METHODOLOGY

SEI has created a portfolio of all of the State of Michigan Retirement Funds equity securities (called Treasury B) and analyzed the portfolio as we would any of the other 4,000 portfolios we evaluate. We also examined an alternative portfolio made up of the Retirement Funds stocks minus those companies doing business in South Africa (called Treasury B-IRRC List). For these two funds, the risk levels, diversification and various fundamental measures such as capitalization, P/E, and earnings growth rate were measured. The effect of divestment on industry weightings was also studied.

RESULTS

Market Value

The market value of the equities in the Treasury B portfolio on September 30, 1985 was $4.72 billion while the Treasury B-IRRC List was $1.97 billion. Removal of all companies doing business in South Africa lowered the market value by 58%.

Risk Statistics

When the risk statistics of the two portfolios are compared, the following is observed:

	Treasury B	Treasury B-IRRC List
Beta	1.14	1.14
R-Squared	0.92	0.86
SEIR	6.93	9.10

These results indicate that the Treasury B-IRRC List Fund has the same beta, a lower R-Squared, and a much higher standard error than the Treasury B Fund. Given current equity holdings, the divested fund appears less diversified and has higher variability of returns. The Treasury B fund has a higher beta and variability (higher SEIR) but is as diversified as other large plans in our data base while the Treasury B-IRRC List has a higher beta and variability and is more undiversified (lower R^2) than other large plans.

Equity Characteristics

Compared with SEI's universe of equity portfolios, the Treasury B portfolio of stocks has characteristics of high capitalization, low return on net worth, high three-year earnings growth rate, and low market/book ratio. Given these characteristics, the Treasury B portfolio has been assigned to the manager style category SEI refers to as Other. To be assigned to this category, a portfolio could not have a price/earnings ratio that ranked consistently in either the top 40% or the bottom 40% of SEI's universe. Also, they could not display any of the distinguishing characteristics that would have resulted in their being assigned to one of SEI's other manager style categories.

When the equity characteristics of the two portfolios are compared, the following is observed:

TOTAL EQUITY HOLDINGS
PORTFOLIO CHARACTERISTICS - SEPTEMBER 30, 1985

	Treasury B	Treasury B-IRRC List
Capitalization	$13.3 bil	$ 4.2 bil
Yield	3.7%	2.8%
P/E	11.5	15.2
Return on Net Worth	11.5%	9.0%
Earnings Growth Rate	16.0%	14.1%

When the financial characteristics of the two portfolios are analyzed, it is found that significant changes occur in all of the measures under divestment. Capitalization falls dramatically from $13.3 billion for the Treasury B fund to $4.2 billion for the Treasury B-IRRC fund while yield also decreases with removal of companies operating in South Africa (from 3.7% to 2.8%). The price/earnings ratio increases substantially from 11.5 for the Treasury B fund to 15.2 for the Treasury B-IRRC fund. Finally, both return on net worth and earnings growth rate decrease when going from the Treasury B fund to the Treasury B-IRRC fund (from 11.5% to 9.0% for return on net worth; from 16.0% to 14.1% for the earnings growth rate). Therefore, the stocks to be divested can be characterized as higher capizalization, lower growth stocks; their removal alters portfolio characteristics to such an extent that the Treasury B-IRRC List portfolio would be assigned to the manager style category SEI refers to as Expected Growth. Assignment to the Expected Growth category means the Treasury B-IRRC List portfolio has a P/E ratio in the top 40% of the SEI equity universe but does not have historical above-median patterns as measured by the three-year earnings growth rate, return on net worth, and market/book ratio.

Industry Concentrations

The Treasury B portfolio shows significant differences in industry sector weighting relative to other portfolios in the SEI universe. The portfolio is overweighted in the building, materials and processing, and technology sectors and was underweighted in the consumer staples sector.

The industry concentrations show some significant changes when South African securities are removed from the Treasury B Fund:

TOTAL EQUITY HOLDINGS
INDUSTRY CONCENTRATION - SEPTEMBER 30, 1985

	Treasury B %	Treasury B- IRRC List %
Building	4	5
Consumer Discretionary	15	12
Consumer Staples	3	6
Energy	9	16
Finance	8	7
Health	5	6
Materials & Processing	9	8
Producer Durables	9	5
Technology	34	32
Transportation	1	3
Utilities	3	0
Other	0	0

The major impact of divestment is seen in the lower commitments to the Consumer Discretionary, Producer Durables, and Utilities sectors and the corresponding increases in the Consumer Staples and Energy sectors. These effects on industry concentration on the Treasury B fund have not been observed in other studies of the South African issue. Other studies have shown a tendency among portfolios to reduce holdings as a percentage of total portfolio in the Technology and Producer Durables sectors and increase holdings in the Utilities, Transportation, and Health sectors.

Given these observations, Michigan could have a divested plan whose industry concentrations matched those of the plan before divestment but would not be able to replicate the equity characteristics of the portfolio since many high capitalization stocks would be disallowed from purchase.

III. TRANSACTION COSTS

1. Due to Initial Divestment

Appendix E contains the details of our transaction cost estimates. We assume that divestment is mandated over a five year period. We further assume that the Investment Bureau is required to sell a minimum amount of the securities in Appendix A in each of the five years. This minimum would equal 20% of the value of such securities held at the beginning of each such year. Finally, we assume that on average over any five years, present investment practices would result in selling about 25% of the South Africa related securities held at any time over the course of the following year.

The effect of the last two assumptions is that for an average outcome the Treasurer's office will be forced to sell only that portion of the South Africa related securities that it otherwise would have kept longer than five years, or approximately 24% of those held when divestment begins. However, if the early years of the divestment process turn out to have been ones in which turnover would otherwise have been unusually low, the divestment-forced transaction costs will be higher. Conversely, if the initial divestment years are ones that would have been marked by unusually high levels of turnover anyway, initial divestment-related transaction costs will be lower than our estimates.

The stocks to be divested are relatively easy to trade. The most likely transaction cost - commissions or dealers' spreads plus impact on realized market price - is .12% of the value of the securities sold. The South Africa related equity holdings in all five portfolios on September 30, 1985, were worth approximately $2.75 billion. The portion that would not ordinarily be sold over five years is 23.7% of $2.75 billion or $650 million. The divestment related cost of sales will therefore be .12% of $650 million or $780,000.

Each sale that would not otherwise have been made, will necessarily be followed by a stock purchase that also would not otherwise have occurred. We calculate transaction costs in the South Africa free stock universe at approximately twice the cost of South Africa related stocks or .22% of value. Thus, the reinvestment will cost an additional .22% of $650 million or $1,435,000.

We must still account for the extra transaction costs incurred from reinvesting the proceeds of sales of South Africa related stocks that would have been sold anyway. A divestment policy will mandate that these proceeds be reinvested in South Africa free stocks at higher transaction costs. The initial round of costs will be the dollars spent times the increment to transaction costs of ($2.75 - $.65 billion) X (.22% - .12%) or .1% of $2.1 billion which is $2,100,000.

The total initial increment to transaction costs as a result of the recommended divestment timetable would thus be the cost of forced additional sales plus forced additional purchases plus the incremental cost of ordinary transactions displaced to the South Africa free universe. We estimate this initial cost at $780,000 + $1,435,000 + $2,100,000 or a total of $4,315,000 spread over the first five years of divestment. This amounts to $865,000 a year for five years; but, as explained in Appendix E, we have projected this cost to grow continuously at the average rate of appreciation of the South Africa related stocks.

2. Due To Ongoing Consequences of Divestment

After divestment is achieved for part or all of the portfolio. there could be continuing costs due to increased frequency of transactions in the South Africa free stocks compared to the divested stocks, and increased costs of each transaction. We estimate in Appendix E that sales turnover will increase from 25% to 35% a year. Thus total transactions will rise from 50% to 70% of the value of the part of the portfolio affected by divestment. We also estimate that transaction costs will nearly double from .12% to .22% of the value of each trade.

The portion of the portfolios affected by these increased trading costs will be the portion that would otherwise be invested in South Africa related stocks. We estimate this to be 55% of all equities, once divestment is fully achieved. We also assume that divestment will be achieved in even increments over the five year transition period. The result of these assumptions is that the ongoing transaction costs as a percentage of the equity portfolio values rise by .009% per year until they reach .054% in year six and thereafter.

The following table summarizes all transitional and ongoing transaction costs of divestment in dollars and as a percentage of the equity portfolio.

TABLE 3.1
TOTAL ANNUAL ADDITIONAL TRANSACTION COSTS FROM DIVESTMENT

YEAR	1	2	3	4	5	6	7	8	9	10
	(dollar figures are in millions)									
Initial	.9	1.0	1.1	1.2	1.3	N/A	N/A	N/A	N/A	N/A
Ongoing	.4	1.0	1.7	2.7	3.8					
TOTAL	1.3	2.0	2.8	3.9	5.1					
% of Total Equity Value	.03	.04	.04	.05	.06	.054	.054	.054	.054	.054

For sources and methods see text of this section, Appendices E and F.

IV. THE COSTS OF LOST INVESTMENT OPPORTUNITIES

Our method of estimating the investment returns that might be lost as a result of a divestment policy is discussed in detail in Appendix F. Essentially, we start by measuring the increased volatility that the equity portfolio would experience after divestment. We make this estimate after allowing for whatever replacement stocks the Treasurer's office will be able to purchase. We then examine the kinds of securities that Michigan currently chooses to own in these portfolios and the mix of assets that Michigan has selected, in order to deduce an implicit trade-off between volatility and expected return.

Finally, the estimated increase in risk is combined with the estimated willingness to trade expected return for risk in order to calculate a loss of return that is "equivalent" to the increased risk. We estimate that number to be no more than .039% per year of the equity portfolios, or approximately $2 million a year on a $5 billion portfolio.

In principle Michigan could choose to actually "pay this price" by shifting its post-divestment portfolio into lower risk, lower return assets as an offset to the higher level of undiversifiable risk with which the portfolio managers would be confronted. This could be done, for example, by slightly increasing the permanent level of cash or short-maturity bonds at the expense of the average level of equity holdings. In practice, Michigan might well proceed with the same investment parameters, earning the same investment returns with increased variability.

As with the ongoing transaction cost increments we have assumed that these opportunity costs would increase in a linear fashion during the divestment period. Table 4.1 provides a synopsis of estimated opportunity costs.

TABLE 4.1
ANNUAL OPPORTUNITY COSTS OF FULL DIVESTMENTS

YEAR	1	2	3	4	5	6	7	8	9	10
% of Total Equity Value	.007	.013	.02	.026	.033	.039	.039	.039	.039	.039
$ millions	.3	.7	1.3	1.9	2.7					

Sources: Accompanying text, Appendix F.

V. CONCLUSIONS

1. Administrative Costs

The South Africa Review Service of the Investor Responsibility Research Center, discussed in Section 2 of the introduction, provides listings, updates and direct access information about companies in South Africa and Namibia, for a fee based on equity assets. The maximum charge is $7,500 a year for portfolios over $5 billion. We allow an additional $2,500 a year for other subscriptions and publications, time spent on correspondence or telephone inquiries to the IRRC, United Nations, individual companies and the possibility of attending the IRRC's annual, one-day conference for subscribers to the South Africa Review Service. This totals as an estimate of the full cost of assuring compliance with divestment.

On September 30, there were 79 different issues in the equity portfolio. Of these, 36 issues, constituting 46% of the number and 58% of the value of all portfolio equities, would be divested (see Appendix B). If the proceeds from these sales were reinvested in positions of the same average size as the existing South Africa free holdings, then there would be 46 names to replace the 36 that were sold (an increase of 28%). Total portfolio positions would increase from 79 to 89, or by 13%.

Since the most suitable South Africa free positions have already been established, and in the interest of reaching a higher estimate of divestment costs, we assume that there will be a 50% increase in the number of replacement companies. So, the 36 divested stocks will be replaced by 54 issues. Accordingly, total positions will increase by 18, from 79 to 97, or by a little less than 23%. We assume a slightly less than proportional increase in analysts (since industry and economic review time will not be affected).

Therefore, the present staff of ten analysts is assumed to grow by 20%, or two persons. We estimate the cost of two analysts at $140,000 per year, including support staff and expenses. An generous estimate of the increase in all adminstrative costs due to divestment is thus:

$10,000 + $140,000 = $150,000.

This is .003% of the value of the equity portfolios at the end of September, 1985. We apply the same percentage to projected future values.

2. Aggregate Costs

The total incremental costs of divestiture will be the transaction costs summarized in Table 3.1, the opportunity costs summarized in Table 4.1, and the administrative costs discussed in the preceding section. Table 5.1, below, combines all these costs in aggregate dollars and as a proportion of the value of the equity portfolios.

TABLE 5.1
AGGREGATE INCREMENTAL COSTS OF DIVESTMENT

YEAR	(thousands of dollars) TRANSACTIONS	OPPORTUNITY	ADMIN	TOTAL	% OF TOTAL STOCK VALUE
1	1,300	325	150	1,775	.036
2	2,000	740	170	2,910	.051
3	2,800	1,270	200	4,270	.066
4	3,900	1,900	220	6,020	.082
5	5,100	2,700	250	8,050	.097
6-10					.096

Sources: Tables 3.1, 4.1, F.5, and preceding text.

The varying amounts and percentages in Table 5.1 can be reduced to a simpler number. Suppose we ask the question, what amount of money would the Michigan Legislature have to appropriate to pay the full anticipated costs of the best estimate of all present and future consequences of divestiture. The answer is the present value of the amounts shown in the table, or the amount of money that would be required to produce that stream of payments at some rate of interest. The appropriate rate of interest is the estimated return on the retirement system portfolios over the ten years through September 30, 1995, or 12.3%.

At this rate of discount, the present value of our best estimates of future divestment costs is $36 million.

3. Effects of Assumptions on the Estimates

The probably effects of most of the assumptions that it was necessary to make for our cost estimates are discussed at the points in the text or appendices where the assumptions are first introduced. We provide brief additional comments here on some of our assumptions.

At the request of the Implementation Commission, we have assumed that the investment style of the past five years would persist into the future. The characteristics of that style are generally more compatible with divestment than almost any other approach other than a passive index fund.

The latter strategy is surely one of the potentially attractive alternatives as Michigan's already large Retirement Systems continue to grow faster than total stock market values. However, its possible advantages are about as great without divestment as with it. It is therefore probable that the incremental cost of divestiture to a passively managed portfolio would be even less than the estimates we have produced, while most other active style configurations would encounter divestment costs higher than these figures.

Our measures of the investment opportunity cost use the increased variability caused by reduced diversification opportunities in the S&P 500, the SEI universe of the 1,500 most widely held institutional stocks, and the same universe limited to those stock with the characteristics associated with Michigan's "Expected Growth" style. While the increase of undiversifiable risk may be small, the reduction in the number and size of the candidates for analysis and selection could conceivably entail some additional cost.

No satisfactory way exists to measure this potential cost. It has recently been argued that managers with a significantly positive alpha (or ability to persistently pick stocks that outperform the market afer adjusting for risk) might well suffer more significant opportunity costs from divestment.

In any case, the evidence of the past five years will not support an assumption that the present Michigan style will produce a positive alpha in the future. If another five or ten years of evidence will or would have confirmed a large, positive alpha, then our opportunity cost estimates may be too low.

All of our calculations measure the investment effects of divestment over a ten-year interval. We are not willing to assume that the parameters of our transactions, opportunity, and administrative cost estimates will remain constant for a longer period. It also does not seem correct to assume that social conditions in South Africa and the United States, or the behavior of corporations with respect to South Africa will remain unchanged into the indefinite future.

_____. "The Cost of South African Divestment: The Case of the Active Manager", BARRA Newsletter #75; August, 1985.

Shortening or lengthening the time horizon would have no effect on each of the annual estimates. However, it would obviously change the present value of the whole series of future costs. Since costs after five years are projected to grow at roughly the discount rate, the effect of adding years to or substracting them from our ten year assumption can be approximated as adding or subtracting about $4.6 million per year to the present value of divestment costs.

The present value calculation is also sensitive to initial market conditions. The stock and bond market advances in the fourth quarter of 1985 had the effect of raising the initial portfolio value and the divestment cost. At the same time, interest rates fell resulting in a lower discount rate. As a consequence, the present value of the adjusted numbers in Table 5.1 would be $40 million for the ten years beginning January 1, 1986 versus $36 million for the decade beginning October 1, 1985.

APPENDIX A

AMERICAN AND FOREIGN COMPANIES TRADED IN U.S. MARKETS THAT OPERATE OR INVEST IN SOUTH AFRICA AND NAMIBIA[1]

AM Intl.
AMCA Int'l Ltd.
ASA Ltd.*
Abbott Labs (S)
AccuRay Corp.
Air Express Int'l
Air Products & Chem.
Alcan Aluminum
Alexander & Alexander
Alleghany Int'l
Allis-Chalmers
Amcahl Corp.
Amer. Brands
Amer. Cyanamid (S)
Amer. Home Products (S)
Amer. Hospital Supply (S)
Amer. Intl. Group (S)
Amer. Standard
Amer. Tel. & Tel.
Amsted Industries
Anglo Amer. Co. S.A.*
Anglo Amer. Gold*
Armco Inc. (S)
Ashland Oil
Baker Int'l Corp.
Bandap, Inc.
BankAmerica Corp.
Bankers Trust NY Corp.
Bausch & Lomb
Baxter Travenol Labs (S)
Beatrice Co.
Black & Decker
Blyvoor Gold*
Borden Inc. (S)
Borg-Warner
Bristol-Myers (S)
British Petrol. Co., PLC
Broken Hill Corp.
Bucyris-Erie
Bundy Corp.
Burroughs Corp. (S)
CBI Ind., Inc.
CBS, Inc. (S)
CIGNA Corp. (S)
CPC Intl. (S)
Carnation Co. (S)
Caterpillar Tractor (S)
Champion Spark Plug
Chase Manhatten Corp. (S)
Chemical New York Corp.*
Cheesebrough-Pond's
Chevron (S)
Chic. Pneu. Tool
Citicorp (S)
Coca-Cola (S)
Colgate-Palmolive (S)
Combustion Engineering
Cominco Ltd.
Cont'l Illinois Holding
Control Data (S)
Cooper Ind. (S)
CoreStates Fin'l
Crocker Nat'l Corp.
Crown Cork
Cummins Engine Co. (S)
Dart & Kraft (S)
De Beers Consol.*
Deere & Co. (S)
Diamond Shamrock
Dominion Textile

1. This listing contains all of the firms displayed in Anne Newman and Cathy Bowers, Foreign Investment in South Africa and Namibia, (Investor Responsibility Research Center Inc., Washington: 1984), pp. 3-188, with revisions from Investor Responsibility Research Center, South Africa Review Service, "Directory Update, November, 1985," pp. 10-12. Names of additional firms obtained from the UNESCO Commission on Transnational Corporations or by the research of the United States Trust Company (Boston) are marked with an "*". Firms that have signed the Sullivan Principles and received a compliance rating of I or II in Arthur D. Little, Inc., The Ninth Annual Report on the Signatory Companies to the Sullivan Principles, (Cambridge: 1985), pp. 24-26, have been indicated with an "(S)".

Donaldson Co.
Dow Chemical (S)
Dresser Ind. (S)
Driefontein*
Du Pont (S)
Dun & Bradstreet
Duriron Co.
Eastman Kodak (S)
Eaton Corp.
Echlin Corp.
Emery Air Freight
Emhart Corp.
Exxon Corp. (S)
FMC Corp. (S)
Falconbridge Ltd.
Federal-Mogul (S)
Ferro Corp.
Firestone Rubber (S)
First Interstate Bnco.
Fluke (John) Mfg. (S)
Flour Corp. (S)
Foote, Cone, & Belding
Ford Motor
Foster Wheeler
Franklin Electric (S)
Free State Geo.*
Fruenauf Corp.
GAF Corp.
GATX Corp.
GTE Corp.
Gelco Corp.
Gen'l Electric (S)
Gen'l Motors (S)
Gen'l Signal Corp.
Gillette (S)
Glaxo Holdings*
Goodyear Tire (S)
Grace (W.R.) (S)
Grey Advertising
Grolier Inc.
Harnischfeger Corp.
Harper Group
Healthdyne Inc.
Hewlett-Packard (S)
Honeywell (S)
Hoover Co.
Hughes Tool
IMS Int'l
ITT Corp. (S)
Ingersoll-Rand
Intergraph
Int'l Business Machines (S)
Int'l Flavors & Frag
Int'l Minerals (S)
Interpublic Group
Irving Bank Corp.
JWT Group (S)
Johnson & Johnson (S)
Johnson Controls, Inc.
Joy Manufacturing (S)
Kellog (S)
Kimberly-Clark
Kloof Gold Mng.*
Koppers
Libbey-Owens-Ford
Lilly, Eli (S)
Lactite Corp.
MacMillan Inc.
Manufacturers Hanover
Marriott Corp. (S)
Marsh & McLennan Cos. (S)
Massey-Ferguson
McGraw-Hill Inc.
McLean Inc.
Measurex Corp.
Medtronic, Inc.
Merck & Co. (S)
Midland-Ross
Millioore Co.
Mine Safety Appliances
Minnesota Mining (S)
Mobil Corp. (S)
Mohawk Data Sciences
Monsanto
Moore Corp.
Morgan (J.P.) & Co.
NCNB Corp. (S)
NCR Corp. (S)
Nabisco Brands, Inc.
Nalco Chemical
National Education
National-Standard Co.
Newmont Mining
Noranda (Mines) Inc.
Norton Co. (S)
Novo Industries*
Ogilvy & Mather Int'l
Olin Corp. (S)
Owens-Illinois, Inc.
PMC Financial Corp.
Parker Pen (S)
Parker-Hannifin Corp.
Pennwalt Corp. (S)
Pfizer, Inc. (S)

Pfizer, Inc. (S)
Phelps Dodge
Phillips Petroleum (S)
Pizza Inn
Plessy Co. PLC
Quaker Chemical
Rank Organization
Raychem
Raytheon Co.
RepublicBank Corp.
Revlon, Inc.
Rexnoro Inc. (S)
Reynolds & Reynolds
Reynolds Inc. (S)
Richardson-Vicks (S)
Robertson (H.H.) Inc.
Robins (A.H.) Co.
Rockwell Int'l Corp.*
Rohm and Haas Co. (S)
Roval Dutch Petroleum*
SPS Technologies
Sara Lee Corp.
Schering-Plough (S)
Schlumberger
Scovill Inc.
Seagram Co.
Searle (S.D.)
Security Pacific Corp.
Shell Transport Co.
Sigmaform Corp.
SmithKline Beckman (S)
Sperry Corp. (S)
Square D
Squibb Corp. (S)
Standard Oil (Ohio) (S)
Stanley Works (S)
Starrett (L.S.) Co.
Stauffer Chemical
Sterling Drug (S)
Stone & Webster
Sun Chemical
Sybron Corp.
Tambrands Inc. (S)
Tenneco, Inc.
Texaco (S)
Texas Commerce Bancshs.
Time Inc. (S)
Timken Co.
Tokheim Corp.
Transworld Corp.
Twin Disc
U.S. Steel
UAL Inc.
Unilever PLC
Union Camp Corp.*
Union Carbide (S)
Uniroyal, Inc.
United Technologies
Upjohn Co. (S)
V.F. Corp.
Van Dusen Air
Warner Communications (S)
Warner-Lambert (S)
Wean United
Western Deep Lev.*
Western Holdings*
Westinghouse Electric (S)
Wynn's Int'l
Xerox Corp. (S)

APPENDIX B
COMPARISON OF ALTERNATIVE DIVESTMENT TIME HORIZONS AND RATES OF IMPLEMENTATION

The transaction costs of implementing a divestment policy are the net costs of selling securities that would not otherwise have been sold in the ordinary course of managing the portfolios, plus the net costs of reinvesting the proceeds in purchases that also would not otherwise have been made.

SEI has measured annual sales turnover of equities for the Public School Employees' and State Employees' Retirement Systems. These two systems own 97% of the equities held by all five systems considered in this report.[2] Moreover, all five funds are managed by the same staff with the same investment policy guidelines and objectives. Thus, average portfolio turnover rates for these two largest portfolios, over the past five years when the present investment personnel and philosophy were largely in place, should be a reasonable estimate of future turnover rates given the same investment approach.

2. Bowman, Robert A., Annual Report of the State Treasurer, Fiscal Year 1983-84, (Lansing: 1985), p.10; and data kindly provided by the Treasurer's office.

Defining the retention rate as one minus the sales turnover rate and taking a geometric average of the retention rate gives an average of .712 for the Public School Employees' Retirement System in the five years ending September 30, 1985, with a range from .535 to .844.[3] Over the same five years the geometric average retention rate for the State Employee's Retirement System is .705 with a range from .539 to .821.[4] Comparable numbers for the full nine year history available in the SEI reports are .731 and .697. Weighting the two ratios by the respective market values of equities in the two portfolios as of September 30, 1985, gives a weighted five year average retention rate of .7105 and a nine year average retention rate of .7232.

After five years of turnover (or retention) at these rates, there would remain $(.7105)^5$ = 18.1% and $(.7232)^5$ = 19.8% respectively, of the initial portfolio holdings. Moreover, five years suggests itself as a reasonable interval to consider for implementing divestment; both because these residual holdings are small, and because almost every major market move from peak-to-peak or trough-to-trough has lasted less than five years.[5] Thus ample opportunity would be available over five years to exploit market timing and sector rotation strategies in disposing of South Africa related stocks.

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3. SEI Funds Evaluation, Balanced Fund Report: Michigan Public School Employees' Retirement System, September 30, 1985, Exhibits Y070, Y080.
4. SEI Funds Evaluation, Balanced Fund Report: Michigan State Employees' Retirement System, September 30, 1985, Exhibits 16, 17.
5. Merrill, Arthur, Filtered Waves Basic Theory, (Analysis Press, Chappaqua: 1977); Wall Street Journal, January 3, 1986, p.31.

It is plausible that the larger companies doing business in South Africa, with their greater internal diversification and greater flow of information available to market participants, would be "core" holdings subject to lower rates of sales turnover than the securities in the South Africa free universe. This hypothesis was checked by computing the sales turnover for South Africa related and South Africa free equities held from June 30, 1984, to June 30, 1985, in the State Employees' Retirement System.[6] In this portfolio, for these twelve months, sales turnover was 20.3% for the South Africa related stocks, 25.3% for the South Africa free stocks and 22.6% for the entire portfolio.[7]

Applying the identical spreads to the average five year retention rate would imply retention rates of .7335 for the South Africa related stocks and .6835 for the South Africa free stocks. In the interest of (conservatively) overestimating the costs of divestment, we assume that the retention rate for South Africa related stocks is as high as .75. Thus, it is assumed that $(.75)^5$ = 23.7% of the South Africa related stocks held today would remain in the portfolio five years hence in the absence of a divestment policy.

---

6. SEI Funds Evaluation Service, Balanced Fund Report, Michigan State Employees' Retirement System, June 30, 1985, "Common Stock Portfolio Progress", 4 pp. in "equity Security Appendixes". This report shows each position as a percentage of total equity portfolio value at the beginning of each calendar quarter. Turnover was calculated as the sums of those percentages times the proportion of shares sold in the subsequent quarter.
7. Ibid, Exhibit Y080

If full divestment is mandated within five years, there are alternative ways of assuring interim progress. A method that specifies selling at least one-fifth of the initial holdings in each of five years is ambiguous. How are subsequent changes in prices and relative holdings to be accounted for? At the end of the third year is it required that the remaining value of South Africa related holdings be 40% of the original value regardless of changes in prices? Or is it required that the remaining securities, valued at original prices, be no more than 40% of the original value?

We propose instead a rule that would require each portfolio to sell South Africa related stocks each year with a value equal to 20% of the value of such stocks at the beginning of the year. This is an unambiguous, reliable rule. It has the additional property of giving the portfolio managers more discretion with respect to the timing of divestment. The following table illustrates the differences.

TABLE B.1
FORCED EQUITY SALES UNDER ALTERNATIVE DIVESTMENT RULES

END OF YEAR	% OF SA STOCKS LEFT @ 75% RETENTION	STRAIGHT LINE RULE	FORCED SALES	20% OF BALANCE RULE	FORCED SALES
1.	.75	.80	0	.80	0
2.	.5625	.60	0	.64	0
3.	.422	.40	.022	.512	0
4.	.316	.20	.10*	.41	0
5.	.237	0	.15*	0	.237
TOTAL FORCED SALES:			.272		.237

*These estimates of forced sales are computed by applying the normal retention rate of .75% to the required level of holdings at the beginning of each year (.4 and .2) in order to compute the additional forced sales required.

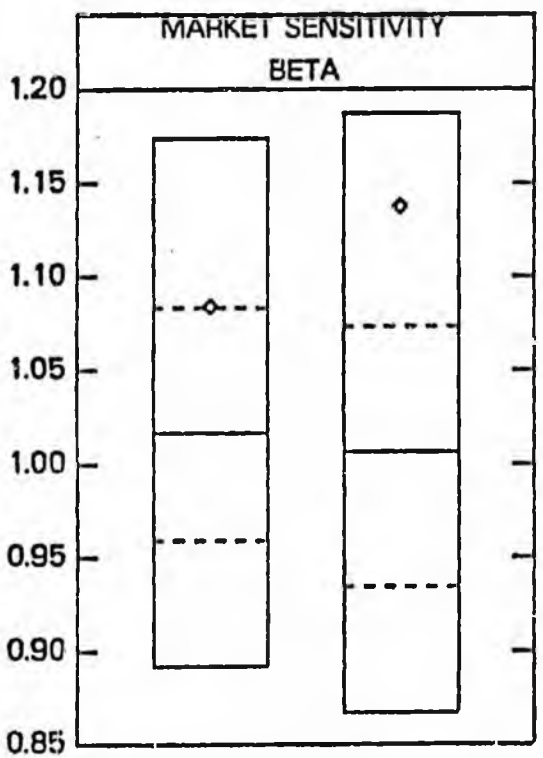
The "straight line rule" refers to the first method mentioned and would apply to either interpretation in the case where prices did not change at all. The "20% of balance rule" is the second method described. At a minimum the straight line rule would be more expensive in proportion to the greater volume of forced sales, (.272/.237) - 1 = 15% greater transaction costs. The reduced timing flexibility of the straight line rule might further increase costs.

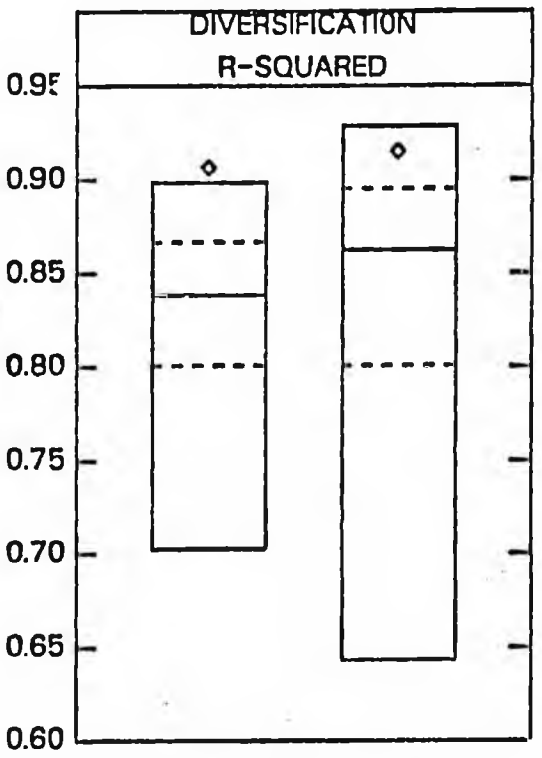
For any other time period, if the "20% of balance rule" is appropriately recalculated, it will not force any sales in excess of the securities that would normally be retained at the end of the divestment period. That is for a ten year divestment period, the Treasurer would be required to sell 10% of South Africa holdings at the beginning of each year during the subsequent year, and so on for any other time period.

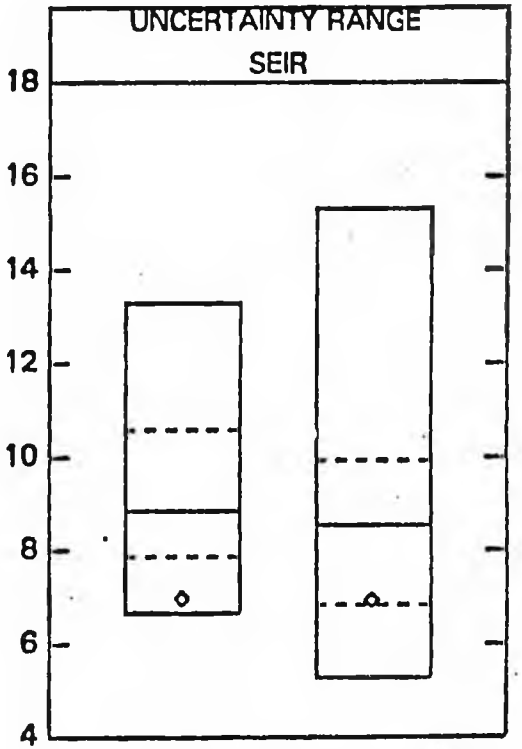
If this were the form of the rule, then the transaction costs of divestment would vary with the time period at least in proportion to the ratios in the first column of the previous table. True costs would vary even more because of the simultaneous variations in timing flexibility. Thus, if the divestment horizon were three years, the associated transaction costs would be more than 78% greater (.422/.237) - 1 = 78%. If the divestment period were seven years, transaction costs would be reduced by 44%, $(.75)^7$ / (.237) - 1 = .44%. In our judgment there would be few additional reductions in costs due to timing flexibility for horizons beyond five years.

APPENDIX C
AN ANALYSIS OF THE MICHIGAN PENSION FUND PORTFOLIOS AND INVESTMENT STYLES

EQUITIES: MARKET SENSITIVITY AND DIVERSIFICATION



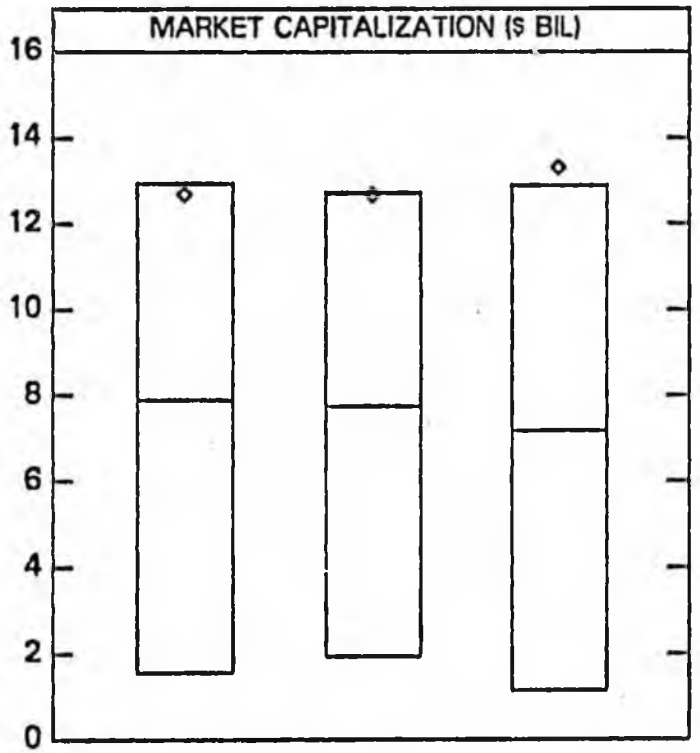


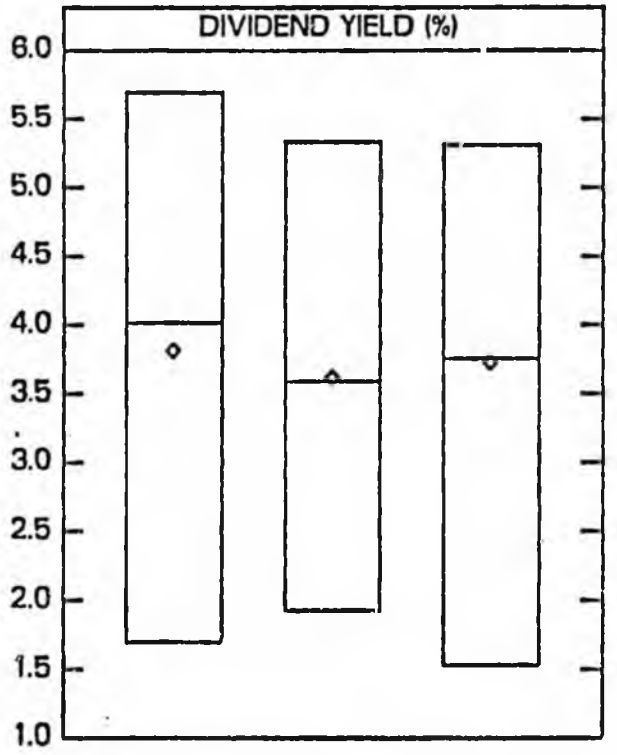


	9/30/84	9/30/85	9/30/84	9/30/85	9/30/84	9/30/85
5TH PERCENTILE	1.17	1.19	0.90	0.93	13.30	15.31
25TH PERCENTILE	1.08	1.07	0.87	0.90	10.57	9.92
MEDIAN	1.02	1.01	0.84	0.86	8.85	8.54
75TH PERCENTILE	0.96	0.93	0.80	0.80	7.86	6.82
95TH PERCENTILE	0.89	0.87	0.70	0.64	6.65	5.26
FUND W1289	1.08	1.14	0.91	0.92	6.96	6.93
PERCENT RANK	25	9	1	13	90	73

EQUITY

EQUITY PORTFOLIO PROFILE

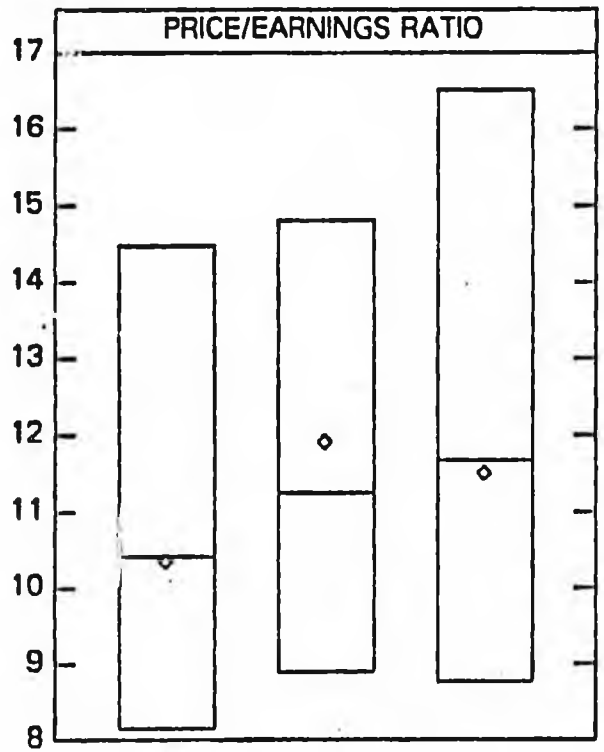


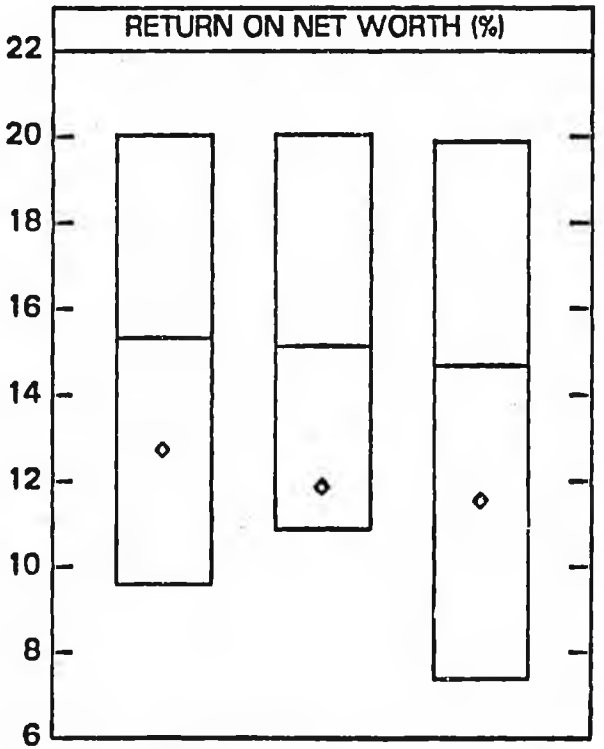


	9/30/84	3/31/85	9/30/85	9/30/84	3/31/85	9/30/85
5TH PERCENTILE	12.9	12.7	12.9	5.7	5.3	5.3
MEDIAN	7.9	7.8	7.2	4.0	3.6	3.8
95TH PERCENTILE	1.6	1.9	1.1	1.7	1.9	1.5
FUND W1289	12.7	12.7	13.3	3.8	3.6	3.7
PERCENT RANK	7	6	4	55	48	51
S&P 500	11.4	11.6	11.3	4.6	4.4	4.4
PERCENT RANK	15	15	13	28	20	25

EQUITY

EQUITY PORTFOLIO PROFILE



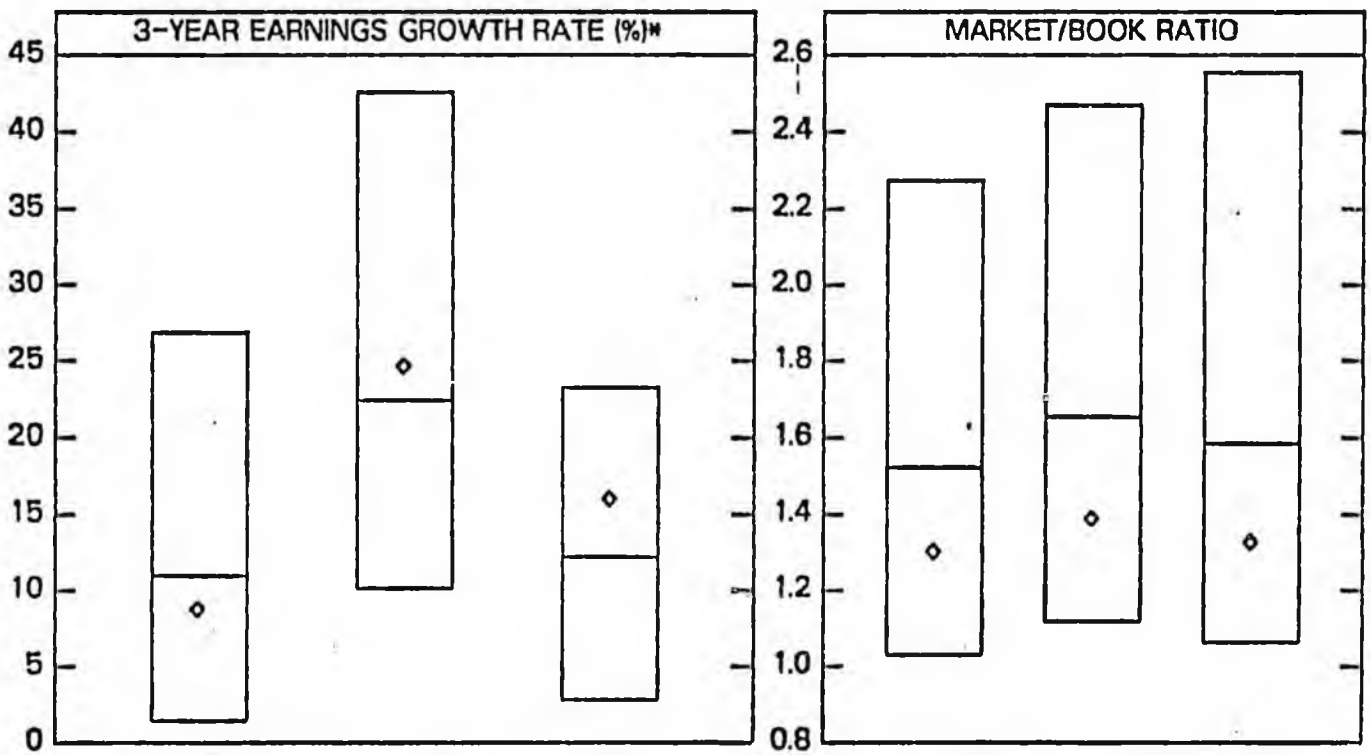


	9/30/84	3/31/85	9/30/85
5TH PERCENTILE	14.5	14.8	16.5
MEDIAN	10.4	11.2	11.7
95TH PERCENTILE	8.1	8.9	8.8
FUND W1289	10.3	11.9	11.5
PERCENT RANK	51	31	55
S&P 500	9.9	11.1	11.8
PERCENT RANK	62	52	46

	9/30/84	3/31/85	9/30/85
5TH PERCENTILE	20.0	20.0	19.9
MEDIAN	15.3	15.1	14.7
95TH PERCENTILE	9.6	10.9	7.4
FUND W1289	12.7	11.9	11.5
PERCENT RANK	81	90	82
S&P 500	13.7	13.6	12.6
PERCENT RANK	69	76	72

EQUITY PORTFOLIO PROFILE

* BASED ON SECURITY EARNINGS THROUGH THE PREVIOUS QUARTER



	9/30/84	3/31/85	9/30/85	9/30/84	3/31/85	9/30/85
5TH PERCENTILE	26.9	42.5	23.3	2.3	2.5	2.6
MEDIAN	10.9	22.4	12.2	1.5	1.7	1.6
95TH PERCENTILE	1.4	10.1	2.8	1.0	1.1	1.1
FUND W1289	8.8	24.6	16.0	1.3	1.4	1.3
PERCENT RANK	68	43	25	76	75	77
S&P 500	10.9	19.7	11.1	1.4	1.5	1.5
PERCENT RANK	50	62	59	67	69	67

MANAGER STYLE

Exhibits in the Manager Style section display seven distributions of equity rates of return, each of which indicates the range of returns for one of the manager style groupings. Your equity portfolio's rate is plotted in the distribution of portfolios with the same manager style as your portfolio. All style classifications are based on the actual structure of the portfolios. The following defines the seven manager style groupings.

DEMONSTRATED GROWTH

The portfolio's price/earnings ratio, return on net worth, three-year earnings growth rate, and market/book ratio must be in the top 50% of funds in the equity universe. The P/E of the equity portfolios in this grouping indicates that investors expect their future earnings growth to be above average of other pension portfolios.

EXPECTED GROWTH

The portfolio's P/E ranks in the top 40% of the equity universe, but the portfolio does not have historical above-median patterns as measured by the three-year earnings growth rate, return on net worth, and market/book ratio.

OTHER

These portfolios have no consistent strong P/E bias. This grouping consists of equity portfolios that have not consistently displayed the distinguishing characteristics of any of the other classifications.

VALUE

The P/E of the portfolio ranks in the bottom 40% of the equity universe. The expected earnings of these portfolios are not fully reflected in their price.

YIELD

The portfolio's dividend yield must be in the top fraction of the equity universe. These portfolios are also characterized by below-median P/E ratios.

STYLE ROTATION

A portfolio that moves over time between either of the growth categories and yield/value is included in this grouping.

UNDIVERSIFIED

The portfolio's Standard Error of Independent Return (SEIR) is in the top fraction of the equity universe. These portfolios have returns that can vary considerably from the S&P 500 return. Portfolios in this grouping usually have at least one of the following characteristics:

- Few stocks
- Few industries
- Low capitalization stocks

SUMMARY OF STYLE ASSIGNMENT

SEI also provides quarter-by-quarter detail behind the style classifications as well as the relative values of capitalization, beta, and SEIR. For capitalization and beta classifications, a high value (H) ranks in the top quarter of values, a low value (L) in the bottom quarter, and a middle value (M) between the 25th and 75th percentiles of all values. For SEIR, a high value (H) ranks in the top fraction and all other values are indicated by (O).

MANAGER STYLE
W1289
SUMMARY OF STYLE ASSIGNMENT

	9/30/82	12/31/82	3/31/83	6/30/83	9/30/83	12/31/83	3/31/84	6/30/84	9/30/84	12/31/84	3/31/85	6/30/85	9/30/85
STYLE	EXP GR	EXP GR	EXP GR	EXP GR	EXP GR	EXP GR	EXP GR	OTHER	OTHER	EXP GR	EXP GR	OTHER	OTHER
CAPIT	H	H	H	H	M	M	M	H	H	H	H	H	H
BETA	H	H	H	H	H	H	M	M	H	H	H	H	H
SEIR	0	0	0	0	0	0	0	0	0	0	0	0	0

STYLE ASSIGNMENT CURRENT QTR: OTHER

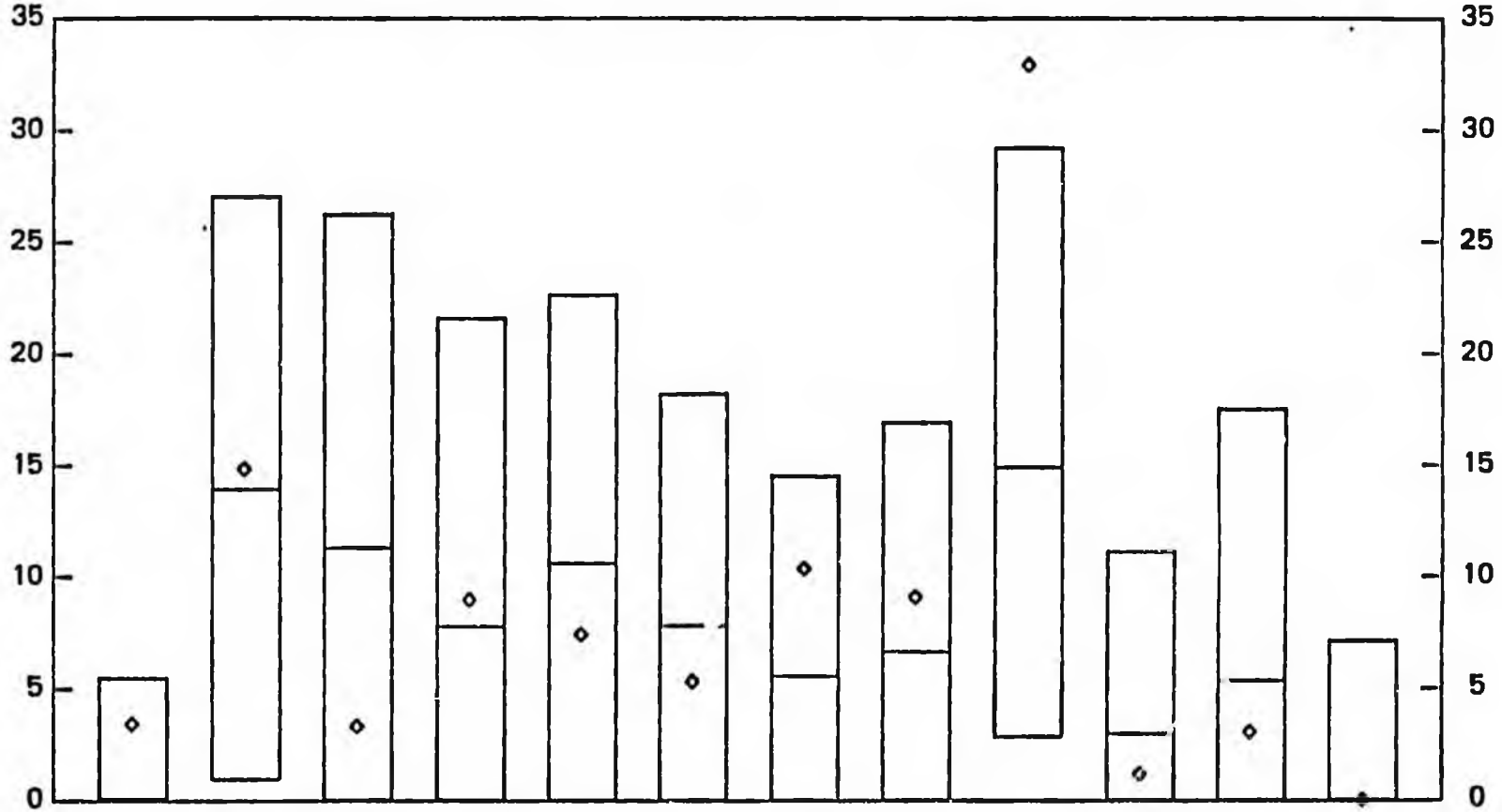
STYLE ASSIGNMENT CURRENT YEAR: OTHER

STYLE ASSIGNMENT TWO YEARS: EXP GR

STYLE ASSIGNMENT THREE YEARS: EXP GR

DIVERSIFICATION BY INDUSTRY SECTOR

9/30/85



	BLDG.	CONS. DISCR.	CONS. STPLS.	ENERGY	FINANCE	HEALTH	MATLS. &PROC.	PROD. DUR.	TECH.	TRANS-PORT.	UTILS.	OTHER
5TH PERCENTILE	5.5	27.0	26.2	21.6	22.7	18.2	14.5	16.9	29.2	11.1	17.5	7.1
MEDIAN	0.1	14.0	11.3	7.8	10.6	7.8	5.6	6.7	14.9	3.0	5.4	0.0
95TH PERCENTILE	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0
FUND W1289	3.4	14.9	3.3	9.0	7.4	5.3	10.4	9.1	32.9	1.2	3.1	0.0
PERCENT RANK	16	43	89	44	68	69	18	38	2	72	59	100
S&P 500	1.7	12.2	13.4	15.4	6.9	7.0	6.4	7.3	15.1	2.7	11.9	0.0
PERCENT RANK	38	56	40	17	73	55	45	47	48	54	17	100

EQUITY

APPENDIX D
THE IMPACT OF DIVESTMENT ON MICHIGAN'S EQUITY SELECTION SET

METHODOLOGY AND RESULTS

METHODOLOGY

SEI evaluates over 4,200 portfolios for 850 plan sponsors with a total market value of $250 billion. A Super Fund was created by adding together all the equity holdings in the various portfolios. The 1500 most widely held stocks from the Super Fund were then selected for analysis. These 1500 securities represented about 96% of the value of all equities held in the data base. A South Africa Free (SAF) Super Fund was then created by removing 222 companies doing business in South Africa.

In a similar fashion, "Super Funds" were created from all portfolios which were classified in each of our seven manager style categories. Again, two benchmark portfolios were established by looking first at the 1500 most widely held stocks in each style category and then removing the companies doing business in South Africa to establish South Africa Free style portfolios.

For those funds, the rates of return were then computed along with risk levels, diversification and various fundamental measures such as capitalization, P/E, earnings growth rates, etc. The effect of divestment on industry weightings was also studied.

RESULTS

The market value of the equities in the 1500 stock Super Fund on June 30, 1985 was $100.1 billion while the South Africa Free portfolio was $62.0 billion. Thus, removing the companies doing business in South Africa lowered the market value by 38%.

When the risk statistics of the two portfolios are compared, the following is observed:

	Super Fund	SAF Super Fund
Beta	1.00	0.97
R-Squared	0.91	0.89
SEIR	6.46	6.81

These results indicate that the SAF fund had a slightly lower beta and R^2 and a slightly higher standard error than the total Super Fund. Both funds would rank among the most broadly diversified (higher R^2) and lowest variability (low SEIR) funds in our data base. This is not surprising since regular funds do not hold nearly as many stocks as are represented in these two portfolios.

When some of the financial characteristics of the two large portfolios are analyzed, it is found that there is not much difference in most of the measures except for capitalization. The capitalization falls dramatically from $8.0 billion to $3.7 billion.

TOTAL EQUITY HOLDINGS
PORTFOLIO CHARACTERISTICS - JUNE 30, 1985

	SUPER FUND	SAF SUPER FUND
Capitalization	$8.0 bil	$3.7 bil
Yield	3.7%	3.6%
P/E	12.4X	12.5X
Return on Net	13.4%	13.0%
Earnings Growth	11.1%	10.9%
Market/Book	1.6X	1.6X

The industry concentrations show some significant changes when South Africa securities are removed from the 1500 stock Super Fund. For comparison purposes, industry weightings for the S&P 500 index are also shown below:

TOTAL EQUITY HOLDINGS
INDUSTRY CONCENTRATION - JUNE 30, 1985

	S&P 500 %	SUPER FUND %	SAF SUPER FUND %
Building	2	2	3
Consumer Discretionary	12	14	17
Consumer Staples	13	12	12
Energy	15	9	10
Finance	7	11	13
Health	7	8	3
Materials & Processing	6	7	6
Producer Durables	8	8	6
Technology	15	15	10
Transportation	3	4	5
Utilities	12	9	14
Other	--	1	1

The major impact of divestment is seen in the lower commitments to the health and technology sectors and the corresponding increase in the utility sector.

It is interesting to note that during the past year, when larger capitalization stocks generally outperformed those with lower capitalization, the performance of the SAF technology stocks was well below that of the Super Fund. This reflects the lower capitalization of those companies remaining in the SAF technology sector. Other industry returns showed mixed results.

TOTAL EQUITY HOLDINGS
INDUSTRY RATES OF RETURN
JUNE 30, 1984 - JUNE 30, 1985

	S&P 500 %	SUPER FUND %	SAF SUPER FUND %
Building	30	31	33
Consumer Discretionary	31	29	33
Consumer Staples	40	42	44
Energy	19	17	14
Finance	62	62	60
Health	36	37	34
Materials & Processing	19	21	21
Producer Durables	25	20	24
Technology	16	15	7
Transportation	45	43	41
Utilities	52	49	52

If we look at the total portfolio, the following results are noted:

TOTAL EQUITY HOLDINGS
RATES OF RETURN
JUNE 30, 1984 - JUNE 30, 1985

S&P 500 %	SUPER FUND %	SAF SUPER FUND %
31.0	30.0	31.4

Performance of the SAF portfolio was enhanced during this period by its lower technology commitment and higher utility exposure and was penalized by lower capitalization. It is important to note that the past performance of these industries or portfolios is not a predictor of future results.

When the same type of analysis is applied to the seven manager styles, some of the same general conclusions can be observed. The magnitude of the changes, however, tends to be larger. Again capitalization is most effected, especially in the more growth oriented portfolios. (See appendices 1-8). The industry shifts within styles tend to be greater reflecting the higher concentration levels of these sub-portfolios. (See appendix 9).

SUMMARY

In summary, the SAF super fund is well diversified relative to the market. In fact, it is more diversified than almost any individual portfolio monitored. Significant differences are seen in the concentration to health, technology and utility sectors when the SAF fund is compared to the total Super Fund. In addition, the SAF fund has dramatically lower capitalization. During recent time periods, the performance differences have been slight.

When these same factors are applied to various style categories, the differences tend to be magnified slightly. There are larger decreases in beta and R^2 and higher variability. Capitalization is lowered, especially for growth oriented portfolios, and industry group concentrations show more fluctuation.

MANAGER STYLES
DEMONSTRATED GROWTH
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND DEMONSTRATED GROWTH	S.A.F DEMONSTRATED GROWTH
BETA	1.07	1.06
R^2	0.88	0.84
SEIR	7.98	9.18
CAPITALIZATION	8.6	3.2
YIELD	2.6	2.2
P/E	14.3	14.7
RETURN ON NET WORTH	15.9	15.7
EARNINGS GROWTH	12.8	16.4

MANAGER STYLES
EXPECTED GROWTH
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND EXPECTED GROWTH	S.A.F EXPECTED GROWTH
BETA	1.05	1.02
R^2	0.89	0.87
SEIR	7.52	7.77
CAPITALIZATION	9.6	3.4
YIELD	3.4	3.0
P/E	12.7	13.5
RETURN ON NET WORTH	12.9	11.9
EARNINGS GROWTH	12.3	11.8

MANAGER STYLES
VALUE
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND VALUE	S.A.F VALUE
BETA	0.99	0.95
R^2	0.90	0.89
SEIR	6.43	6.76
CAPITALIZATION	8.2	4.3
YIELD	3.8	3.9
P/E	12.0	11.7
RETURN ON NET WORTH	14.2	14.1
EARNINGS GROWTH	11.0	10.4

MANAGER STYLES
YIELD
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND YIELD	S.A.F YIELD
BETA	0.93	0.87
R^2	0.90	0.86
SEIR	6.10	6.98
CAPITALIZATION	7.7	4.4
YIELD	5.0	5.2
P/E	10.8	11.1
RETURN ON NET WORTH	12.7	12.3
EARNINGS GROWTH	9.1	8.6

MANAGER STYLES
STYLE ROTATOR
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND ROTATOR	S.A.F ROTATOR
BETA	1.01	0.99
R^2	0.90	0.88
SEIR	6.93	7.35
CAPITALIZATION	8.4	4.2
YIELD	3.3	3.2
P/E	12.3	11.8
RETURN ON NET WORTH	16.2	15.4
EARNINGS GROWTH	12.5	13.3

MANAGER STYLES
OTHER
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND OTHER	S.A.F. OTHER
BETA	1.02	1.00
R^2	0.88	0.86
SEIR	7.40	8.42
CAPITALIZATION	8.0	3.3
YIELD	3.4	3.1
P/E	11.2	12.9
RETURN ON NET WORTH	13.7	12.6
EARNINGS GROWTH	13.4	12.1

MANAGER STYLES
UNDIVERSIFIED
RISK & PORTFOLIO CHARACTERISTICS
JUNE 30, 1985

	SUPER FUND UNDIVERSIFIED	S.A.F. UNDIVERSIFIED
BETA	1.01	0.99
R^2	0.87	0.84
SEIR	7.91	8.54
CAPITALIZATION	4.3	2.0
YIELD	2.5	2.3
P/E	15.2	15.0
RETURN ON NET WORTH	12.4	12.3
EARNINGS GROWTH	13.6	15.8

TOTAL EQUITY HOLDINGS
RATES OF RETURN
JUNE 30, 1984 - JUNE 30, 1985

	SUPER FUND %	SAF SUPER FUND %
Demonstrated Growth	28.2	27.4
Expected Growth	26.2	26.5
Value	32.2	34.4
Yield	35.9	40.7
Style Rotation	31.8	33.6
Undiversified	26.6	24.6
Other	30.5	32.8

MANAGER STYLES
MAJOR INDUSTRY SHIFTS

	DEMONSTRATED GROWTH	EXPECTED GROWTH	VALUE	YIELD
CONSUMER DISCRETIONARY	16→23	12→14	15→19	13→10
ENERGY	4→ 3	7→10	9→12	15→16
HEALTH	11→ 6	9→ 4	9→ 4	6→ 1
TECHNOLOGY	19→16	22→17	15→ 9	8→ 4
UTILITIES	4→ 5	4→ 4	10→16	16→24

APPENDIX E
TRANSACTION COST ESTIMATES IN DETAIL

1. Implementation Costs

On September 30, 1985, the five pension funds had $4.72 billion invested in equities of which $2.75 billion, or 58%, was invested in securities issued by the companies listed in Appendix A. These holdings represented approximately 66 million shares in 36 different companies, with an average price of 42 per share.[8] Of this amount 23.7% that would otherwise not have been sold, would have to be sold as a result of divestment over five years (see Appendix B).

Selling these large, actively traded companies over a period of five years will entail an average commission cost of $.05 per share, and on average no additional market impact cost. This amounts to .12% of value (i.e. .05/42). On the sell side, total transaction costs of divestment are therefore estimated at

.237 X $2.75 billion X .0012 = $780,000.

8. SEI Funds Evaluation Service, Balanced Fund Report, Michigan State Employees' Retirement System and Public School Employees' Retirement System, September 30, 1985, "Common Stock Portfolio Progress", plus analysis supplied by the Bureau of Investments.

The following table summarizes SEI's key findings regarding trading costs as they relate to trade difficulty. This is based upon our Trading Evaluation Service Studies of over 50,000 trades per month from 300 managers with over 275 brokers for the year ending 6/30/85. To use this table, it is necessary to first convert the cents-per-share figures to percent-of-principal figures. This percentage can then be applied to the principal amount to be bought or sold.

One-Way Transaction Cost Ranges for the Year Ending 6/30/85
in Cents per Share

	Moderately Difficult			Difficult		
	25	50	75	25	50	75 *
Commissions	10¢	9¢	7¢	9¢	7¢	6¢
Execution	10	-3	-14	17	0	-17
Total	18¢	5¢	-5¢	25¢	7¢	-9¢

*"25, 50, 75" denote quartiles of the cost distributions. For example, the "25"th percentile is the one-in-four highest cost.

The South Africa free stocks that would be purchased for the portfolios will be smaller capitalization, lower price-per-share, more difficult to trade issues than the South Africa related equities. The average South Africa free stock already in the portfolios on September 30, 1985, had an average per share price of 39 and a portfolio value weighted market capitalization of $4 billion compared to $18.9 billion computed on the same basis for the South Africa related holdings. During the fiscal year ending September 30, 1985, South Africa free stocks purchased had an average price per share of $32 (versus $48 for South Africa related purchases), while South Africa free stocks sold had an average price of $43.60 (versus $47).[9]

We assume the lowest of these numbers, of 32 as the average price of the South Africa free securities to be purchased versus 42 for the South Africa related securities to be sold. We also assume more difficult trading conditions, so that average costs will be .22% or approximately $.07 per share. (see "One-Way Transaction Cost" table on previous page) On the purchase side, the initial costs of divestment will be the cost of reinvesting the proceeds from sales that would otherwise not have been made plus the added transaction cost of reinvesting the proceeds of investment motivated sales in South Africa free equities. These total

.237 X $2.75 billion X .0022	$1,435,000
+ .763 X $2.75 billion X (.0022 - .0012) =	2,100,000
	$3,535,000.

9. Computed from a Memorandum from Barry L. Stevens to Sabrina Keeley, October 29, 1985.

And the grand total of transaction costs added by a divestment policy would be $780,000 plus $3,535,000 or $4,315,000. Dividing by five to spread the cost evenly over five years yields approximately $865,000 a year.

We assume that these transaction costs will increase in proportion to equity prices and are truly more related to the value of the equities than to the number of shares being transacted.

In Appendix F we estimate that the value of common stocks, including the South Africa related portfolio, will be increasing at an average rate of 10.25%. The following table gives out most likely estimates of the initial transaction costs due to divestment over each of the five transition years.

TABLE E.1
ESTIMATED INITIAL INCREMENT TO TRANSACTION COSTS FROM DIVESTMENT

YEAR	COST*
1.	$908,000
2.	1,001,000
3.	1,104,000
4.	1,217,000
5.	1,342,000

*This is the cost calculated in the text, multiplied by the square root of 1.1025 for the first year and by 1.1025 for each successive year.

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2. Ongoing Additions to Transaction Costs

Once the initial divestment process is completed, transaction costs could be changed for two reasons. First, the expense of each transaction might be different in the South Africa free universe. Second, the frequency of transactions might be different as well. We estimate that costs will increase on both accounts.

In the preceding portion of this Appendix, we have estimated that the cost of a given transaction will increase from .12% to .22% of its value. In Appendix B we calculate average turnover rates (one minus the "retention rates" discussed there) of 26.65% for the South Africa related stocks and 31.65% for the South Africa free stocks presently in the portfolios. The reason for the higher turnover of South Africa free equities is presumably their lower degrees of internal diversification and their exposure to potentially larger information surprises.

In Appendix B we took the actual turnover rate for South Africa related stocks at 25%. Because the additions to the South Africa free portfolio may be smaller companies than the present holdings, we take the turnover rate of the new South Africa free positions at 35%.