PRELIMINARY PERFORMANCE REVIEW

OF THE

WEST VIRGINIA STATE BOARD OF INVESTMENTS

Excessive Liquidity

Investment Responsibilities

Management Fees

Performance Evaluation and Research Division
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July, 1995

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Antonio E. Jones, Ph.D.
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July 7, 1995

The Honorable A. Keith Wagner
State Senate
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The Honorable Joe Martin
House of Delegates
Building 1, Room 213E
1900 Kanawha Boulevard, East
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Gentlemen:

Pursuant to the West Virginia Sunset Law, we are transmitting this Preliminary Performance Review of the **Board of Investments** which will be reported to the Joint Committee on Government Operations at the July 9, 1995, interim meeting. The issues covered herein are "Excessive Liquidity, Fiduciary Responsibilities and Management Fees." Included in the report is a response from Mr. Craig Slaughter, Executive Director, West Virginia State Board of Investments.

Sincerely,

Antonio E. Jones

AEJ/wsc

Enclosure

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West Virginia Board of Investments

Executive Summary

The West Virginia Board of Investments (BOI) is responsible for collecting, disbursing, managing, and investing about $4.6 billion of public funds. This amount is divided into two distinct funds, the Consolidated Pension Fund and the Consolidated Operating Fund. These funds are described below.

TABLE A	
FUNDS MANAGED BY THE BOARD OF INVESTMENTS	
Consolidated Pension Fund	Consolidated Operating Fund
Public Employees' Retirement	Cash Liquidity Pool a) State Operating Funds b) Local Government Funds
Judges Retirement	Government Money Market Pool
Public Safety Retirement	Enhanced Yield Pool
Teachers' Retirement	Municipal Bond Commission
Workers' Compensation	Loss Amortization Pool
Workers' Compensation II	State Loan Pool
Pneumoconiosis	Participant Directed Accounts
Total Portfolio = $3.3 Billion	Total Portfolio = $1.3 Billion

This preliminary performance review identified three areas of concern, which are briefly described below.

Issue Area 1: Excessive Liquidity Has Resulted in the State Receiving Lower Earnings Over the Past Two Years

The BOI has held on average between $500 million and $1 billion of public funds in cash-equivalent assets every day for the past two years. On average, the amount of cash is as much as 14 times what the state or pension funds need for daily expenses. The result of holding such large amounts of cash is that interest earnings have been a few million dollars lower annually because much of this cash could have been invested in longer-term assets that earn a higher rate of return than cash-equivalent assets.

Issue Area 2: **<u>The Board of Investments Should Use Greater Diligence in Carrying Out Its Investment Responsibilities</u>**

By statute, the BOI is required to invest public funds with high standards of care to ensure the safety of the funds. Until March of this year, the BOI invested substantial amounts in repurchase agreements using an investment arrangement considered to be the riskiest method available. The PERD contends that state funds were placed at risk unnecessarily. While the Performance Evaluation and Research Division (PERD) considers the new arrangement implemented last March to be a much safer method of investing, this change in policy should have been made years ago.

Issue Area 3: **<u>Management Fees Do Not Reflect Actual Costs of Managing Funds</u>**

The BOI is authorized to make a charge against the earnings of the various funds it manages. This charge is transferred to the General Revenue Fund. This provision is intended to reimburse the General Revenue Fund for the costs of investing pension funds and local government funds. However, because of statutory language, it is difficult for the BOI to make a charge that equals the costs incurred to invest these funds. Consequently, over the past five fiscal years the amount charged in management fees exceeded actual costs by $1,358,497. These overcharges are primarily from pension funds that are transferred to the General Revenue Fund. The PERD does not believe that this was the intention of the law.

WEST VIRGINIA BOARD OF INVESTMENTS

Review Objective, Scope and Methodology

Review Objective, Scope and Methodology

This preliminary performance review of the West Virginia Board of Investments (BOI) (see Appendix A for member and staff roster) is required and authorized by the West Virginia Code in the "Sunset Law" (Chapter 4, Article 10). The responsibilities of the BOI are set forth in Chapter 12, Articles 1 through 6. The BOI has been given the authority to develop and maintain modern systems for the collection, disbursement, management and investment of public moneys. The intent of the BOI's statute is to provide the state a source of increased revenue consistent with sound financial practices.

The objective of the review was to determine if the BOI's investment procedures are consistent with the legislative purpose for creating the Board of Investments. In particular, the review focused on whether the BOI's investment practices demonstrate a high standard of care, consider the probable safety of the invested principal as well as the income to be derived, and benefit the citizens, teachers and public employees of this state.

The scope of the review included investment practices and procedures, and compliance with the state's law over the 1991 to 1995 period. From 1987 to 1990 the BOI was within the State Treasurer's Office. During that time the state experienced large investment losses. In 1991 the BOI became a separate state entity. This review considers the 1987-1990 period to determine if the necessary controls are in place to prevent a reoccurrence of large losses.

The methodology included personal interviews with members of the BOI and the BOI's staff. Other interviews were conducted with officials of the Consolidated Public Retirement Board, the West Virginia Association of Counties, the West Virginia Public Employees' Retirement System Association, and three of the BOI's investment advisors. The review also involved analysis of financial information and a telephone survey of the country's offices of state treasurers. Every aspect of this review complied with **Generally Accepted Government Auditing Standards**.

ISSUE AREA 1: Excessive Liquidity Has Resulted in the State Receiving Lower Earnings Over the Past Two Years

For more than two years the West Virginia Board of Investments has followed an investment policy that places a premium on liquidity. Although liquidity is needed to pay for daily expenditures, too much liquidity can result in less earnings. For state, local, and pension funds, the excess liquidity has meant lower earnings that could total a few million dollars annually.

On any given day, the BOI invests between $500 million to $1 billion in cash-equivalent assets called repurchase agreements (repos). These agreements are investments that have short maturities, usually one day. Repurchase agreements have become a popular way of investing short-term. If properly collateralized, repos are safe, earn a fair rate of return, and provide liquidity for daily disbursements (expenses).

A primary reason to invest in overnight repos is to have enough funds available for day-to-day expenses. Investing in repos can also be advantageous during periods of rising interest rates. As rates are increasing, funds held in repos are available the next day to invest at prevailing rates. At some point when it appears rates have peaked, liquid balances can be locked-in to long-term assets with relatively high interest rates. Thus, repos are instruments that allow the investment manager to reallocate the portfolio when conditions dictate. However, in the long run, repos earn a lower rate of return than most other allowable investments (see Appendix B).

Table 1 illustrates the average daily amounts invested in repos. During calendar years 1993 and 1994, the Consolidated Operating Fund had an average daily repo balance of $531.5 million and $623.9 million respectively. For the Consolidated Pension Fund, the average daily repo balance for 1993 and 1994 was $124.2 million and $193.7 million respectively. Repo balances have typically been between 50% to 60% of the Consolidated fund. The highest daily repo balance for any month has been as high as $1 billion in 1994, when the pension and operating funds are combined.

TABLE 1

Average Daily Repo Balances & Percent of Portfolio					Highest Monthly Average of DAILY Repo Balances	
CY Year	Consolidated Operating Fund	%	Consolidated Pension	%	Consolidated Operating Fund	Consolidated Pension
1993	$531.5 M	57.3	$124.2 M	3.9	$634.2 M	$205.0 M
1994	$623.9 M	56.3	$193.7 M	6.0	$706.1 M	$297.5 M

Calculations based on BOI/State Street Bank Reports of Investment Accounts

The Performance Evaluation and Research Division's (PERD) examination shows that the levels of repo balances the BOI has maintained are excessively high from two points of view. One, the repo balances far exceed the daily expenses for either the pension funds or the state's operating fund. Secondly, the repo balances and interest rate trends do not correspond with an investment strategy to reallocate the portfolios.

Repo Balances Far Exceed Liquidity Needs

A primary purpose for investing in repos is to have cash available to pay daily expenditures. Unlike other investment securities that return the investment and interest months or years later, repos return the investment and interest usually the next day, allowing the investor to have cash on hand every day. Being able to earn interest and have cash available every day to pay expenses is an attractive feature of repos. The major disadvantage is the interest rate on repos will generally be lower than most other investments.

The BOI needs to have a certain amount invested in repos so that it can earn interest and have cash each day to pay the state's expenses. However, **good cash management involves knowing how much is needed each day in cash, so that any excess can be invested in securities that have higher rates of return than repos.** As a qualifier, there is justification for keeping some daily cash above what is normally needed to provide a cushion for unexpected expenditures. However, cash (repo) balances held beyond a reasonable cushion represent foregone earnings from longer-term assets with higher returns than repos.

A daily cash flow analysis was done by the Budget and Fiscal Affairs Division of the Legislative Auditor's Office. The results of this study are summarized in Table 2, and the complete study is in Appendix C. The largest one-day disbursement from the General Revenue Fund during FY 1994 was $44.3 million, and the largest net disbursement was $33.8 million. These figures are consistent with the BOI staff's experience which informed the PERD that their daily cash needs to cover net disbursements (disbursements less revenue) do not exceed $100 million on any one day.

TABLE 2

State Cash Flow Statistics

Average Daily Net Disbursement for Federal, General & Special Revenue Funds for FY 1993	Largest One-day General Revenue Disbursement During FY 1994	Largest One-day General Revenue Net Disbursement During FY 1994
$4.1 Million	$44.3 Million	$33.8 Million

Source: West Virginia Legislative Auditor's Office, Budget and Fiscal Affairs Division

In addition, there is a clear pattern of cash flow for the General Revenue Fund. The highest disbursement amounts occur on two days on or between the 15th and 22nd of the month and on the last day of the month. This corresponds with state payroll days. Revenues can be expected according to the state's tax cycle. For example, the state's sales tax is due the 15th of each month. Revenue high points are one to three days following the 15th. Also, the months of August, November, February, and May typically have large receipts during the first two to three days of the month because of quarterly tax deadlines.

Table 3 highlights the difference between the state's daily cash needs and the amount of liquidity BOI maintains. The state's cash needs are relatively small, on average. This shows that the amount of cash the BOI needs on any day is substantially lower than the $600 million invested in cash-equivalent repos each day. **This makes the average daily repo balance 12 to 14 times the state's maximum single day need for liquidity.** Although the PERD recognizes the need for a cushion to protect against unexpected cash out-flows, a $300 to $500 million cushion in PERD's opinion is excessive and has resulted in lost earnings.

TABLE 3

Liquidity Needs versus Liquidity Held

CY Year	General Fund Largest 1-day Disbursement	General Fund Largest 1-day Net Disbursement	Average Daily Repo Balance (Operating)	Highest Daily Repo Balance (Operating)
1993	$41.2 M	$31.6 M	$531 M	$634 M
1994	$44.3 M	$33.8 M	$624 M	$706 M

Sources: West Virginia Legislative Auditor's Office, Budget and Fiscal Affairs Division, State Street Bank Reports of BOI Accounts

Consolidated Pension Fund Also Too Liquid

On any given day, withdrawals are also made from the Consolidated Pension Fund to cover disbursements for benefit payments, annuity loans, and other daily expenditures. Employers' and employees' contributions are also deposited in the fund. The pensions are not pooled as is the Consolidated Operating Fund, so contributions made by one pension plan cannot be used to cover withdrawals of another plan. The BOI invests in repos to have funds available for withdrawals.

Table 4 compares the cash flow of the Consolidated Pension Fund with the Fund's average daily cash-equivalent balances for the past two calendar years. The withdrawal activity of the fund varies, with the pension funds typically making only one or two withdrawals a month, while the Workers' Compensation Fund makes several withdrawals a month. However, in total, the dollar amount of withdrawals from the fund is relatively small. The largest 1-day withdrawal from the fund over the past two years was $25 million in 1994. The total amount of withdrawals from the fund made in a month averaged $31.3 million in 1993 and $43.9 million in 1994.

With this size of cash flow in the Consolidated Pension Fund, BOI is holding 7 to 12 times the amount of cash-equivalent assets it needs for the largest one-day withdrawal.

TABLE 4

Consolidated Pension Fund

	CY 1993	CY 1994
Withdrawals		
Average Withdrawal	$2.4 M	$3.3 M
Average Monthly Total Withdrawals	$31.3 M	$43.9 M
Largest 1-day Withdrawal	$17.6 M	$25.1 M
Average Daily Repo Balance	$124.2 M	$193.7 M
Largest Repo Balance	$205.0 M	$297.5 M

Source: PERD analysis based on BOI Reports on Contributions and Withdrawals of the Consolidated Pension Fund

In reviewing the BOI's high rate of repos, PERD examined whether this was an intentional investment decision to maximize the rate of return through riding interest rate fluctuations to their high points before investing long-term or a decision to simply maintain the majority of the state's assets in cash. Therefore, PERD discussed this issue with BOI's three outside investment advisers for the Consolidated Operating Fund, compared West Virginia's repo strategies to those of other states, and examined BOI's repos strategies by comparing the fluctuation in the percentage of BOI's investments held in repos to fluctuations in market interest rates, since January 1993.

Discussions With BOI Investment Advisers

The PERD interviewed BOI's three advisors for the Consolidated Operating Fund. We informed them that over half the Consolidated Operating Fund was invested in repos each day. In a written response, one advisor stated that "There probably is more liquidity than is needed for the entire portfolio." Another advisor wrote a response to the issue of having half the fund in repos. He stated that he normally does not see the entire fund, only that part which he advises, but "if that were the case, it would seem to be rather high." He further stated that:

> ...the funds available for investment have grown and that the state is currently experiencing positive cash flow. The board has a large cash cushion, a part of which could be invested in short to intermediate maturity instruments. These instruments would fluctuate in value but still be liquid enough to meet unexpected draw downs without significant loss.

The same advisor added that the BOI was considering this option for a portion of the monies. However, this growth in the funds has been evident to the BOI's staff for two years. In the December 16, 1994 BOI meeting, the staff reported on the Consolidated Operating Fund by stating that "the State funds are growing and have been for the past couple of years."[1] It appears from the high amount of daily repo balances that little of this growth is being placed in longer-term assets to earn a higher return.

The BOI has an Enhanced Yield Pool which, according to BOI rules, "...is composed of the operating funds of the State which the BOI's staff have determined are not immediately needed to fund the State's liquidity requirements." Yet, with the growth of the Consolidated Operating Fund, only $25 million was placed in this pool in July 1994 when the pool was established. For nearly a year, the BOI has not increased this amount. One advisor suggested that the $25 million in the Enhanced Yield Pool was probably too small a percentage of the operating funds. He further stated that he did not think the Enhanced Yield Pool is structured to offer much of an enhanced yield.

Discussions With Other States

The PERD conducted a telephone survey of state treasurer's offices to see what extent other states use repos. We found that other states on average keep much lower repo balances as a percent of their operating portfolio. Thirty-four state treasurer offices responded to the survey. The results showed that on average the respondents held 17.4% of their operating portfolio in repurchase agreements, in comparison to BOI's 56%. The results of the survey are exhibited in Appendix D.

Large Repo Balances Not a Response to Market Conditions

Graph 1 below compares the movement of the federal funds rate with the percentage of the Consolidated Operating Fund invested in repos. This comparison is made to show that the high repo balances were not the result of an investment strategy to reallocate the portfolio.

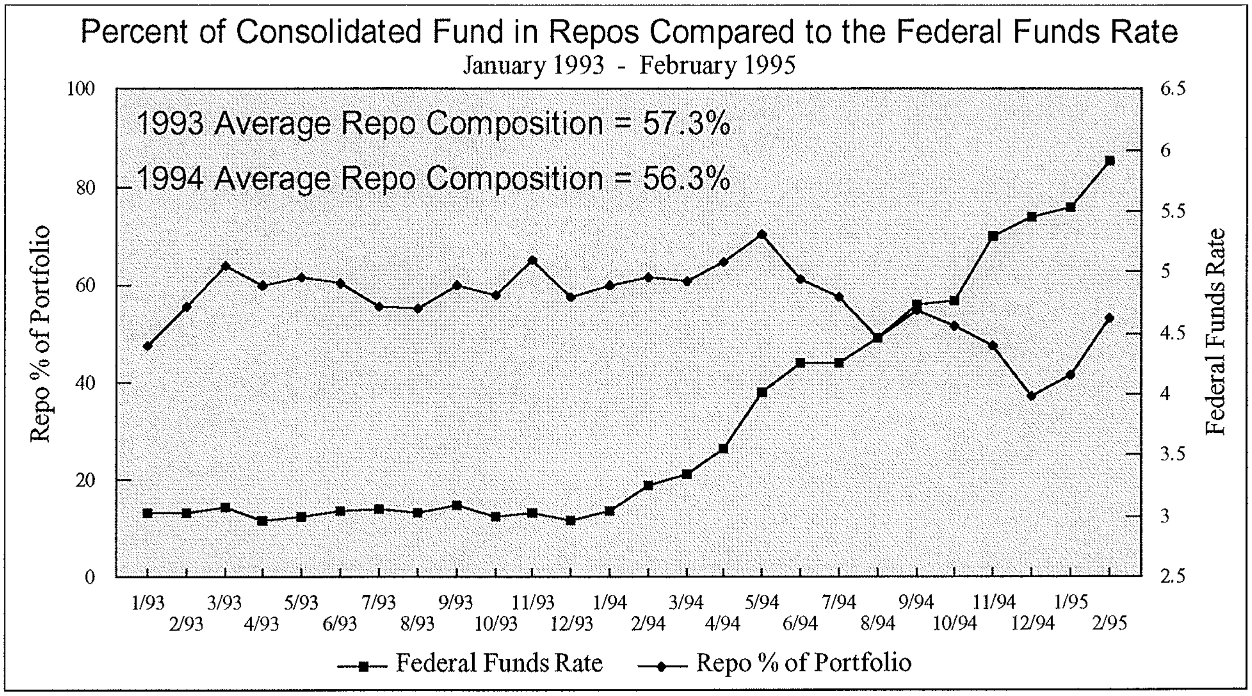
The federal funds rate is the interest rate banks charge other banks for overnight loans. This rate is a widely used indicator of the direction of other interest rates. During calendar year 1993, the federal funds rate held steady near 3%. During this time the BOI held 57.3% of the Consolidated Operating Fund in repos every day on average. The State did not need this much liquidity as we indicated previously. Starting in February of 1994, interest rates began to rise steadily and continued to rise during the first few months of 1995. However, the percent of the Consolidated Operating Fund invested in repos was about the same (56.3%).

One would expect under the scenario just described that as interest rates started to rise cash balances would increase to be in position to invest in longer-term assets at relatively high

[1] Minutes for the West Virginia Board of Investments meeting on December 16, 1994, page 5.

rates. Once interest rates peaked, cash balances should be lower. However, cash balances were already high to begin with when rates were flat, and as rates rose during 1994 repos were about the same percentage on average. There is one month (December 1994) when the percentage dropped to 37%, but then it goes back up to 53% in February when rates were still rising. This suggests that the large repo balances were not accumulated to reallocate the portfolio. It appears that the BOI's strategy was to hold half of the Consolidated Operating Fund in repos regardless of movements in interest rates.

GRAPH 1



Causes of Large Excess Liquidity

The PERD identified four causes of the excess liquidity: 1) The lack of a twelve-month daily cash flow projection; 2) There is a trepidation or uneasiness concerning a repeat of the 1987 losses; 3) BOI's rules place most of the Consolidated Operating Fund under a money market structure; and, 4) A communication barrier between BOI's staff and BOI's investment advisers.

Cause 1 - Lack of an Annual Daily Cash Flow Projection

The major explanation for the large excess liquidity is a lack of daily cash flow projections for the year. The cash flow analysis used by BOI is primarily historical information. BOI receives some advance cash flow information from its Electronic Funds Transfer Division consisting of a monthly calendar of any scheduled large withdrawals. Also, the State Auditor's office sends the BOI a summary list of checks as they are about to be issued. At least for any month in advance, BOI has adequate cash flow data for the Consolidated Operating Fund.

However, for any decision to be made on investing liquid funds in longer-term assets, BOI needs cash flow data for longer than one month ahead. Daily cash flow projections for the entire fiscal year would be important for BOI to make long-range investment decisions. This is something that could be done for the General Revenue Fund. The historical pattern of General Revenue Fund disbursements is clearly defined. Furthermore, the Department of Administration makes annual revenue projections for the General Revenue Fund. The revenue flow for the General Revenue Fund is also predictable over time.

For the Consolidated Pension Fund, BOI has several years of daily historical cash flow data for each pension plan. There is no distinct daily cash flow pattern. Some pension plans go months without making withdrawals, while the Workers' Compensation Fund makes frequent withdrawals each month. Although daily cash flow projections may not be possible, monthly cash flow estimates would serve a purpose. The Consolidated Public Retirement BOI supplies BOI with annual estimates of benefit payments and retirement contributions. However, it is important for BOI to know the levels and the timing of withdrawals and contributions, at least on a monthly basis.

Cause 2 - Trepidation or Uneasiness Concerning a Repeat of the 1987 Losses

Another reason for the high level of liquidity could be an outgrowth of the 1987 losses. The BOI may want to maintain the confidence of the agencies and local governments that their funds are being invested safely. One advisor considered this to be a legitimate reason for the BOI placing a premium on liquidity. An essential feature of the money market structure (as defined by the Securities and Exchange Commission) is that it offers safety and liquidity. However, another feature of the money market structure is that its yields are commonly low on the yield curve.

While maintaining the confidence of the participants is an understandable objective, 1987 was an extreme situation caused by a foolish long-term investment strategy. Over all of 1987, the State was invested so heavily in long-term securities that the average maturity for the year was 8.2 years. In fact in April of 1987, the average maturity for the Consolidated Operating Fund's investment was 10 years. Furthermore, the average maturity for the Local Governments' Account was 17 years! Obviously, such an investment strategy with the State's operating funds, unless executed to perfection with all interest rate fluctuations, would cause a shortage of liquidity for the State. This is exactly what happened in 1987, when the State Treasurer's Office guessed wrong concerning interest rates. This resulted in the State having to borrow money through reverse repos to raise the necessary cash to meet its obligations.

Compare that with the situation of 1995. Most of the Consolidated Operating Fund now has an average maturity of less than 40 days. Furthermore, in contrast to raising cash through reverse repos, the BOI is now investing close to $1 billion in repos daily. The BOI has gone from one extreme to another. Thus, although the present emphasis on liquidity is much better than the high-risk strategy pursued in 1987, PERD believes that the present strategy does not properly balance risks with earning potential.

Therefore, PERD believes that the BOI should consider extending the average maturity of the Consolidated Operating Fund beyond the guidelines of a money market structure, with the average maturity being set at less than a year, and maximum single investments set at two years or less. As long as the BOI stays within such new guidelines and invests in high grade securities, it will earn higher yields and should have the confidence of the participants.

Cause 3 - BOI's Rules Are Based Upon the Security and Exchange Commission's Rules for Money Market Funds

Another cause of BOI's excess liquidity is that **the BOI has placed nearly the entire Consolidated Operating Fund under a money market structure.** To commit most of the State's funds to money market rates of return seems questionable. Money market rates are generally the lowest rates that can be earned. Table 5 illustrates that as of January 1995, 68.8% of the Consolidated Operating Fund was structured to earn a money market rate of return.

TABLE 5

Money Market Pools as a Percent of the Consolidated Operating Fund (January 1995)

	Money Market Pools		
	Cash Liquidity Pool	Government Money Market Pool	Consolidated Fund
Amount	$841.3 Million	$90.3 Million	$1,351.6 Million
% of Consolidated Operating Fund	62.2 %	6.6%	100.0%

Source: BOI, Operating Fund Performance Reviews, First Quarter 1995

Moreover, the Cash Liquidity Pool, which contains nearly two-thirds of the State's funds, has had an average maturity of 16 days over the last 2 years. However, the money market structure allows an average maturity of up to 90 days. Therefore, not only is the Consolidated Operating Fund restricted to a money market structure, most of it has been invested well short of the 90 day average maturity limit.

One of the advisors for the Consolidated Operating Fund was asked if he had any clients the size of the BOI that have restricted their portfolio to earn money market rates. The advisor's answer was no.

As stated previously, even the Enhanced Yield Pool does not offer much of an enhanced yield according to one advisor. This advisor stated that an appropriate enhanced yield pool should have an average maturity of one to one and one half years. Currently, the Enhanced Yield Pool is structured to have an average maturity of less than one year, and as of April 1995 the pool has actually averaged only 151 days maturity.[2] In addition, the BOI has placed only $25 million in this pool.

Overall, PERD believes that the Consolidated Operating Fund should have a much longer average maturity than at present. PERD believes that the rules promulgated by the BOI to restrict the State's funds to a money market structure has resulted in a sizable loss of earnings. Rules should be promulgated to allow the Consolidated Operating Fund to have an average maturity greater than 90 days. The PERD recognizes the concerns the BOI's staff has with this approach because it would require mutual fund accounting of the funds. However, restricting up to $1 billion to money market rates is an expensive price to pay to avoid mutual fund accounting.

Cause 4 - Communication Barrier Between BOI's Staff and BOI's Investment Advisers

The PERD asked the BOI's staff why it invests so much in repos every day. The staff's response was that BOI policy required them to follow the advice of the advisors. When PERD interviewed the three advisors of the Consolidated Operating Fund, two advisors agreed there was too much liquidity within the fund overall. Each advisor is responsible for a portion of the fund, and bases his advice only on the funds he advises. They generally do not see the entire Fund.

There is some concern when the staff generally follows the advice of the advisors, and the advisors agree that the fund is too liquid. The point is that if the staff follows the advice of the advisors, and the advisors see only a portion of the portfolio, then there appears to be a lack of oversight of the entire portfolio. It makes sense to follow the advice you pay for. However, the advice of the advisors needs to be coordinated by the staff to achieve objectives for the entire portfolio. This can be achieved by the BOI giving advisors more specific information on the BOI's objectives for desired liquidity levels, liquidity cushions, and specific ranges of average maturities for each pool.

Effect of Excess Liquidity

Large liquid balances that can be invested in longer term assets will generally earn a higher rate of return than repo rates. Generally speaking, the longer the average maturity of the portfolio, the higher the rate of return. Table 6 illustrates this using information from the BOI's quarterly reports.

The BOI has two pools within the Consolidated Operating Fund that are structured as money market funds, the Cash Liquidity Pool and the Government Money Market Pool. The guidelines for investing these pools are the same, investments are limited to purchases of securities with remaining maturities not greater than 397 days and the dollar weighted-average maturity of the securities may not exceed 90 days.

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[2] *The PERD notes that the average maturity of the Enhanced Yield Pool increased substantially for the months of February through April of 1995, as indicated in Table 6 of this review. The PERD considers this a move in the right direction.*

Table 6 illustrates that even within a money market structure investing with longer average maturity can result in higher yields in the long run. The Cash Liquidity Pool had an average maturity of 16 days from March 1993 to April 1995. The average total return during that time for the pool was 4.05%. Over the same period, the Government Money Market Pool had an average maturity of 52 days, and an average total return of 4.15%. The Enhanced Yield Pool is structured to have an average maturity longer than the money market structure. When the enhanced yield rates are compared with the money market pools, the result is similar. Over the period between July 1994 and April 1995, the Enhanced Yield had an average maturity of 151 days compared to 66 days for the Government Money Market and 39 days for the Cash Liquidity Pool. The average total return for the Government Money Market Pool was higher than the Cash Liquidity Pool by 12 basis points and the Enhanced Yield Pool was higher by 23 basis points.

There is a sizable amount of earnings to be gained from achieving 25 basis points more each year on investments. The PERD argues that 25 basis points is the minimum amount of lower earnings. Twenty-five basis points represent $250,000 in earnings per $100 million invested. Since the state invests several hundred million dollars in the Cash Liquidity Pool, and repo balances are too high for pension funds, the loss of earnings can easily add up to a few million dollars.

Furthermore, the PERD believes the earnings are lower by more than 25 basis points. Not only is it possible for the BOI to invest with a longer average maturity within the money market structure, the PERD believes that a portion of the excess liquidity could be invested in a structure that has a longer average maturity than the Enhanced Yield Pool.

Conclusion

In conclusion, the PERD contends that the BOI has invested too much of the State's funds in cash-equivalent assets. The rate of return could be higher if the BOI's rules allowed the Consolidated Operating Fund to have an average maturity greater than the current 90 days. Current rules restrict most of the State's funds to money market rates. The amount of lost earnings to the State is likely a few million per year.

TABLE 6

COMPARISON OF TOTAL RATES of RETURN WITH DIFFERENT AVERAGE MATURITIES

	Cash Liquidity Pool		Government Money Market		Enhanced Yield Pool	
Month/Year	Total Return	Average Maturity (in days)	Total Return	Average Maturity (in days)	Total Return	Average Maturity (in days)
Mar/93	3.17%	1	3.69%	34		
Apr/93	3.11%	3	3.78%	41		
May/93	3.07%	4	3.28%	47		
Jun/93	3.14%	1	3.08%	42		
Jul/93	3.18%	3	3.14%	47		
Aug/93	3.11%	1	3.09%	52		
Sep/93	3.12%	1	2.88%	42		
Oct/93	3.08%	3	3.42%	47		
Nov/93	3.12%	1	3.08%	46		
Dec/93	3.17%	3	3.21%	56		
Jan/94	3.09%	1	3.14%	41		
Feb/94	3.29%	1	3.21%	32		
Mar/94	3.37%	4	3.34%	53		
Apr/94	3.62%	2	3.53%	46		
May/94	3.97%	1	3.81%	44		
Jun/94	4.19%	1	4.32%	40		
Jul/94	4.30%	33	4.66%	66	4.29%	1
Aug/94	4.56%	23	4.43%	80	4.50%	1
Sep/94	4.72%	31	4.79%	75	4.73%	73
Oct/94	4.84%	44	4.90%	59	5.03%	110
Nov/94	5.20%	47	5.30%	18	5.46%	178
Dec/94	5.51%	37	5.19%	81	5.92%	191
Jan/95	5.55%	27	5.90%	71	5.90%	177
Feb/95	5.90%	49	6.07%	77	6.34%	276
Mar/95	5.99%	49	6.37%	71	6.32%	261
Apr/95	6.01%	49	6.21%	62	6.40%	250
Averages Mar 93 - Apr 95	4.05%	16	4.15%	52	n/a	n/a
Averages Jul 94 - Apr 95	5.26%	39	5.38%	66	5.49%	151

Source: BOI of Investments, Operating Fund Performance Reviews, and internal reports.

Recommendation 1

The BOI should work with the Legislative Auditor's Budget and Fiscal Affairs Division to develop annual projections of daily cash flow for the General Revenue Fund for the upcoming fiscal year. Thereafter, the BOI will develop these projections on its own. These 12 month projections should then be made available to advisors every month.

Recommendation 2

The BOI should consider giving advisors more specific guidelines that reflect the BOI's objectives for the Consolidated Fund overall. The BOI should provide advisors specific information on what levels of liquidity the BOI desires, how much of a liquidity cushion is needed, and specific ranges of average maturities within the pool's structure, instead of giving only the top maturity limit. The performance measures may need to be adjusted periodically if specific guidelines preclude the possibility of the advisor meeting the performance measures.

Recommendation 3

The BOI should consider rule changes that allow the Consolidated Fund to be invested between the guidelines of a money market structure and a mutual fund structure.

Recommendation 4

The BOI should consider restructuring the Enhanced Yield Pool to achieve a higher enhanced yield. The BOI should also consider increasing the amount within the Enhanced Yield Pool from the current level of $25 million.

Recommendation 5

The Legislature should consider amending WVC §5-10D-4 to require the actuary for the pension funds to provide the BOI with monthly projections of withdrawals and contributions for the fiscal year for each pension plan. In addition, the amendment should include the requirement that the projections be updated each quarter or more frequently if necessary. The actuary currently projects annual contributions and benefit payments for the pension funds.

Recommendation 6

The Legislature should consider amending WVC §5a-2-11 to require the Department of Administration to provide the BOI with its monthly revenue projections. The Legislature should also consider requiring the Department of Administration to project daily revenue flows for the General Revenue Fund.

Issue Area 2: <u>The BOI Should Use Greater Diligence in Carrying Out Its Investment Responsibilities</u>

The BOI is required by statute to use investment practices that are conducted with high standards of care. The conclusion of this review indicates that the BOI did not given sufficient consideration to the safety of public funds.

Repurchase Agreements

For several years, the BOI has entered into repurchase agreements using a method considered to be the riskiest way. For more than two years, the BOI has invested close to $1 billion daily in repurchase agreements. A repurchase agreement is an arrangement where one party agrees to lend another party a certain amount of money. The borrower gives the lender securities as collateral under the agreement that the securities will be "repurchased" by the borrower from the lender for the amount of the loan with a specified interest payment. Thus, the lender has made a collateralized loan and receives the principal amount back with interest. Generally, repos are overnight loans.

There are three ways that a repo can be arranged. Each way hinges on how the collateral is handled. These three ways are briefly described below:

> **"Delivery-versus-Payment (DVP)":** This method requires the borrower to first deliver collateral to the lender's custodian bank before the money is transferred to the borrower. This ensures that the lender has the collateral "in-hand". If the borrower defaults on the loan, the lender can sell the collateral to regain the principal amount. The cost of this method is highest of the three methods because of the costs incurred by both parties to deliver the collateral and transfer the funds. However, the risk is the lowest of the three methods because the lender has possession of the collateral.
>
> **"Tri-party":** This method works similarly to DVP, except that a third party is responsible for receiving the collateral for the lender and transferring the funds to the borrower. The advantage is that the third party usually is the borrower's custodian bank. This cuts down on the delivery costs because the custodian bank already has custody of the borrower's securities. Also, the third party is responsible for the paperwork associated with providing that the collateral is what the lender can accept and has the proper value. This method has lower transaction costs than DVP and the risks are lower than hold-in-custody.
>
> **"Hold-in-Custody":** This method allows the collateral to be held or set aside by the borrower in an account for the lender. There are no transaction costs because the borrower keeps possession of the securities. This method generally has the highest rate of return of the three methods, but it has the highest risk because the lender does not have possession of the collateral.

The BOI had been using the hold-in-custody method for several years until March 22, 1995. At that time the BOI decided to do all of its repos using the DVP arrangement. This change in policy was prompted by a recommendation made in the *Bear Stearns* report which was released in December 1994. Given the fact that over half of the state's General Revenue Fund is invested in repos on any given day, the change in policy greatly reduced an unnecessary risk to the state's operating and pension funds.

An advisor for BOI talked to the staff about perfecting interest in its repos since 1990. The BOI's staff and the Governor (who chairs the BOI) were again informed in a March 1992 memo. The memo stressed the importance of perfecting a security interest in the collateral. In fact, the advisor attached an article to his memo to illustrate to the BOI the reality of the risk. The article documented recent cases in which investors lost their investment in repurchase agreements because lenders did not have a perfected interest in the collateral. The article also issued a statement from Standard & Poor's which concluded that:

> "...the risk of hold-in-custody arrangements is unacceptable for S&P's highest ratings...."

The BOI did respond to the advisor's concern by trying to enter into a tri-party arrangement. However, the contract was disapproved by the State's Attorney General because the governing law of the agreement would have been New York's law. This means that if a repo went bad, BOI would have to rely on New York's legal system. The reason the BOI did not pursue an agreement using West Virginia's law was that third parties would either not agree to the arrangement under that condition or they offered lower interest rates.

After the Attorney General disapproved the tri-party contract, the BOI was faced with a decision of whether to continue with the hold-in-custody method, or use DVP. The BOI decided to continue using hold-in-custody.

TABLE 7

How Other States Conduct Repurchase Agreements

	Delivery vs Payment	Tri-Party	Hold in Custody
Number of States	25	4	5

DVP:	Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Idaho, Illinois, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Nebraska, Nevada, New Jersey, New York, South Dakota, Virginia, Washington, Wisconsin, Wyoming
Tri-Party:	Alabama (Alabama law), Kentucky (New York law), Minnesota (New York law), Rhode Island (Rhode Island law)
Hold in Custody:	Indiana, New Hampshire, Ohio, Vermont

Source: Results of a telephone survey conducted by the West Virginia Legislative Auditor's Office, Performance Evaluation and Research Division

The PERD was interested to see how other states invest in repos. Out of the fifty states the PERD contacted by telephone, 34 state treasurer offices responded. Table 7 (on page 18) shows the results. A large majority of the states that responded take possession of the collateral when entering into a repurchase agreement.

For several years, the risks of repurchase agreements have been a concern of public officials responsible for investing. The Government Finance Officers Association issued its official statement on repos in 1986. It affirmed the use of repos as a viable investment instrument, but it acknowledged the risk by stating that:

> Proper collateralization practices are necessary to protect the public funds invested in repurchase agreements. Risk is <u>significantly</u> reduced by <u>delivery</u> of underlying securities through physical delivery or safekeeping with the purchaser's custodian. (Emphasis added)

The same investment advisor who informed the BOI in 1990 of the risk, told the PERD that for a while BOI was the largest investor on Wall Street that did not have a perfected interest in the collateral of its repurchase agreements.

Recommendation 7

The Legislature should consider amending WVC 12-6-5(9) to require that the BOI use Delivery-versus-Payment or Tri-Party arrangements in conducting repurchase agreements.

ISSUE AREA 3: Management Fees Do Not Reflect Actual Costs of Managing Funds

The BOI is authorized to " . . . make a charge against the earnings of the various funds managed by the board for all necessary expenses of the board. The charge shall be on a pro-rata basis of actual earnings of the various funds managed by the board. The charge shall be deposited to the credit of the general revenue fund" (§12-6-6a).

This language has the unintended effect of causing the funds to be overcharged. The BOI has complied with the law in the manner it makes this charge. However, the way the statute is written, which requires the charge to be against actual earnings, it is difficult to avoid charging an amount that is either over or under the BOI's actual costs.

Each fiscal year, the BOI receives an appropriation from the General Revenue Fund for budgeted expenses. By rule, the BOI makes a monthly charge against the actual earnings of the various funds within the Consolidated Operating Fund and the Consolidated Pension Fund. The fee has generally been 1% to 1.25% of earnings. These charges are subsequently credited to the General Revenue Fund. West Virginia Code §12-6-6a is intended to reimburse the General Revenue Fund for the BOI's actual operating costs. This mechanism allows the state and local governments to pay the costs associated with investing their funds, and the pension funds to pay for their respective share of the costs.

During the past four fiscal years, the BOI has charged service fees totalling $1,358,497 above its actual expenses. This is illustrated in Table 8. In terms of asset composition, the Consolidated Pension Fund represents 72% of the total portfolio managed by the BOI, while the operating fund is 28% of the total. During FY 1994 BOI charged the Consolidated Pension Fund $3,424,350 in management service fees which represents about 82% of the total charges.

TABLE 8
Actual BOI Expenses & BOI Management Fees

Fiscal Year	Actual Expenses	Service Fees Charged	Difference
1991	$2,267,274	$2,622,382	+ 355,108
1992	3,241,195	2,935,319	- 305,876
1993	3,324,393	3,355,009	+30,616
1994	3,472,492	4,187,516	+715,024
1995*	2,770,312	3,333,937	+ 563,625
Total	$15,075,666	$16,434,163	$ 1,358,497

** Expenses and Charges are through May 1995.*

Cause and Effect of the Overcharge

Current charges are based on net earnings which are volatile and have little relationship with the actual costs of investing. Furthermore, a situation could occur where realized and unrealized losses could reduce net earnings to zero, which would mean no service fee could be charged. This was pointed out by an audit done by *Bear Stearns*. Nevertheless, the BOI is required by law to charge a fee in this manner.

Since over 80% of the total charge is assessed against the Consolidated Pension Fund, most of the overcharge is coming from pension funds. Consequently, pension funds and the Workers' Compensation Fund are being diverted to the General Revenue Fund. **The PERD does not believe that this was the intention of the law.** The statute does not allow for any overcharge to be transferred back to the Consolidated Pension Fund where they could be reinvested.

Furthermore, it is not clear that the actual costs of investing pension funds are proportional to total earnings or total assets. A more accurate approach to determining the actual investment costs should be used. Ideally, the service charge should be assessed based on the actual cost of services used by each fund. If this cannot be done, then costs should be at least based on asset size, not actual earnings. If the second option is chosen, the BOI should develop a cost allocation plan which estimates the cost between the Consolidated Operating Fund and the Consolidated Pension Fund. After this split is determined, the BOI should allocate actual costs by asset size.

Recommendation 8

The Legislature should consider amending §12-6-6a to allow the BOI to calculate the management service fee using an actual cost allocation formula. An alternative amendment would be to have the fee based on net assets. Net earnings are volatile and do not reflect the actual cost of investing the funds. The service fee should pay for the BOI's actual expenses, not its appropriated budget.

Recommendation 9

If the Legislature decides to amend §12-6-6a to base the service fee on net assets, PERD recommends that the language allow the BOI to transfer to the Consolidated Pension Fund and local governments, any excess service fees charged, rather than have any overcharge diverted to the General Revenue Fund.

Appendices

Appendix A
West Virginia Board of Investments

Board Members	**Staff**
Honorable W. Gaston Caperton, III Governor/Chairman	
Mr. John T. Poffenbarger Executive Secretary/Member	H. Craig Slaughter Executive Director
Honorable Larrie Bailey Treasurer/Member	D. Jerry Simpson Chief Operating Officer
Honorable Glen B. Gainer, III Auditor/Member	Matthew E. Jones Chief Financial Officer
Mr. Richard Riederer Member	Diana Will Chief Investment Officer
Mr. William T. Tracy Member	Mark E. N. Asaad General Counsel

Appendix B

COMPARISON OF INTEREST RATES OF SELECT INSTRUMENTS

January 1990 - March 1995

(Source: Federal Reserve System)

Note: The Federal Funds Rate serves a good proxy for the interest rates on repurchase agreements.

	1990													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	*i -- Fed f.*
Investment Instruments														
Federal funds	8.23	8.24	8.28	8.26	8.18	8.29	8.15	8.13	8.20	8.11	7.81	7.31	**8.10**	
Commercial paper, 1-month	8.20	8.22	8.32	8.32	8.24	8.21	8.09	7.99	8.09	8.04	7.84	8.28	**8.15**	**0.05**
Commercial paper, 3-month	8.10	8.14	8.28	8.30	8.25	8.14	7.99	7.88	7.96	7.98	7.91	7.80	**8.06**	**-0.04**
Commercial paper, 6-month	7.96	8.04	8.23	8.29	8.23	8.06	7.90	7.77	7.83	7.81	7.74	7.49	**7.95**	**-0.15**
Finance paper, 1-month	8.09	8.13	8.23	8.23	8.14	8.12	7.99	7.88	7.98	7.92	7.64	7.62	**8.00**	**-0.10**
Finance paper, 3-month	7.90	7.97	8.04	8.13	8.12	8.01	7.87	7.69	7.74	7.80	7.75	7.32	**7.86**	**-0.24**
Finance paper, 6-month	7.34	7.40	7.49	7.74	8.04	7.79	7.66	7.46	7.50	7.50	7.42	6.95	**7.52**	**-0.57**
Bankers acceptances (3-mo.)	7.97	8.03	8.15	8.21	8.12	8.00	7.86	7.75	7.83	7.85	7.82	7.60	**7.93**	**-0.17**
Bankers acceptances (6-mo.)	7.83	7.91	8.11	8.18	8.08	7.89	7.73	7.64	7.70	7.67	7.58	7.25	**7.80**	**-0.30**
CDs, 1-month (secondary)	8.17	8.19	8.30	8.32	8.25	8.20	8.09	7.98	8.08	8.03	7.92	8.27	**8.15**	**0.05**
CDs, 3-month (secondary)	8.16	8.22	8.35	8.42	8.35	8.23	8.10	7.97	8.06	8.06	8.03	7.82	**8.15**	**0.05**
CDs, 6-month (secondary)	8.17	8.26	8.48	8.57	8.48	8.28	8.12	7.99	8.06	8.05	7.95	7.64	**8.17**	**0.07**
Eurodollar deposts-Ldn(1-mo.)	8.20	8.19	8.29	8.32	8.22	8.19	8.09	7.99	8.09	8.02	7.94	8.32	**8.16**	**0.06**
Eurodollar deposts-Ldn(3-mo.)	8.22	8.24	8.37	8.44	8.35	8.23	8.09	7.99	8.07	8.06	8.04	7.87	**8.16**	**0.07**
Eurodollar deposts-Ldn(6-mo.)	8.24	8.30	8.53	8.62	8.51	8.29	8.13	8.01	8.09	8.05	7.94	7.67	**8.20**	**0.10**
Prime Rate	10.11	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	**10.01**	**1.91**
Discount Rate	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.79	**6.98**	**-1.12**
T-bill, 3-month (auction avg.)	7.64	7.76	7.87	7.78	7.78	7.74	7.66	7.44	7.38	7.19	7.07	6.81	**7.51**	**-0.59**
T-bill, 6-month (auction avg.)	7.52	7.72	7.83	7.82	7.82	7.64	7.57	7.36	7.33	7.20	7.04	6.76	**7.47**	**-0.63**
T-bill, 1-year (auction avg.)	7.21	7.42	7.76	7.72	8.05	7.65	7.52	7.37	7.25	7.01	6.81	6.58	**7.36**	**-0.74**
T-bill, 3-mo. (auctn avg. invst)	7.90	8.02	8.14	8.05	8.05	8.00	7.92	7.68	7.63	7.42	7.30	7.02	**7.76**	**-0.34**
T-bill, 6-mo. (auctn avg. invst)	7.93	8.14	8.26	8.25	8.25	8.06	7.98	7.75	7.72	7.58	7.40	7.10	**7.87**	**-0.23**
T-bill, 3-month (secondary)	7.64	7.74	7.90	7.77	7.74	7.73	7.62	7.45	7.36	7.17	7.06	6.74	**7.49**	**-0.61**
T-bill, 6-month (secondary)	7.55	7.70	7.85	7.84	7.76	7.63	7.52	7.38	7.32	7.16	7.03	6.70	**7.45**	**-0.65**
T-bill, 1-year (secondary)	7.38	7.55	7.76	7.80	7.73	7.53	7.40	7.26	7.24	7.06	6.85	6.61	**7.35**	**-0.75**
T-bond, 1-year (constant)	7.92	8.11	8.35	8.40	8.32	8.10	7.94	7.78	7.76	7.55	7.31	7.05	**7.88**	**-0.22**
T-bond, 2-year (constant)	8.09	8.37	8.63	8.72	8.64	8.35	8.16	8.06	8.08	7.88	7.60	7.31	**8.16**	**0.06**
T-bond, 3-year (constant)	8.13	8.39	8.63	8.78	8.69	8.40	8.26	8.22	8.27	8.07	7.74	7.47	**8.25**	**0.16**
T-bond, 5-year (constant)	8.12	8.42	8.60	8.77	8.74	8.43	8.33	8.44	8.51	8.33	8.02	7.73	**8.37**	**0.27**
T-bond, 7-year (constant)	8.20	8.48	8.65	8.81	8.78	8.52	8.46	8.64	8.79	8.59	8.28	8.00	**8.52**	**0.42**
T-bond, 10-year (constant)	8.21	8.47	8.59	8.79	8.76	8.48	8.47	8.75	8.89	8.72	8.39	8.08	**8.55**	**0.45**
T-bond, 30-year (constant)	8.26	8.50	8.56	8.76	8.73	8.46	8.50	8.86	9.03	8.86	8.54	8.24	**8.61**	**0.51**
Difference in Federal Funds		**1990**												
1mo. C-paper less F-funds	-0.03	-0.02	0.04	0.06	0.06	-0.08	-0.06	-0.14	-0.11	-0.07	0.03	0.97	**0.05**	
1 mo. F-paper less F-funds	-0.14	-0.11	-0.05	-0.03	-0.04	-0.17	-0.16	-0.25	-0.22	-0.19	-0.17	0.31	**-0.10**	
1 mo. CD's less F-funds	-0.06	-0.05	0.02	0.06	0.07	-0.09	-0.06	-0.15	-0.12	-0.08	0.11	0.96	**0.05**	
3 mo. T-bill less F-funds	-0.59	-0.48	-0.41	-0.48	-0.40	-0.55	-0.49	-0.69	-0.82	-0.92	-0.74	-0.50	**-0.59**	
6 mo. T-bill less F-funds	-0.71	-0.52	-0.45	-0.44	-0.36	-0.65	-0.58	-0.77	-0.87	-0.91	-0.77	-0.55	**-0.63**	
1 yr. T-bill less F-funds	-1.02	-0.82	-0.52	-0.54	-0.13	-0.64	-0.63	-0.76	-0.95	-1.10	-1.00	-0.73	**-0.74**	

	1991													
Investment Instruments	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sep.**	**Oct.**	**Nov.**	**Dec.**	**Average**	***i -- Fed f.***
Federal funds	6.91	6.25	6.12	5.91	5.78	5.90	5.82	5.66	5.45	5.21	4.81	4.43	**5.69**	
Commercial paper, 1-month	7.12	6.53	6.48	6.08	5.91	6.06	5.98	5.72	5.57	5.29	4.95	4.98	**5.89**	**0.20**
Commercial paper, 3-month	7.10	6.49	6.41	6.07	5.92	6.11	6.05	5.72	5.57	5.35	4.98	4.61	**5.87**	**0.18**
Commercial paper, 6-month	7.02	6.41	6.36	6.07	5.94	6.16	6.14	5.76	5.59	5.33	4.93	4.49	**5.85**	**0.16**
Finance paper, 1-month	6.95	6.31	6.31	5.95	5.76	5.93	5.86	5.58	5.43	5.18	4.80	4.69	**5.73**	**0.04**
Finance paper, 3-month	6.92	6.38	6.28	5.94	5.81	5.96	5.89	5.56	5.33	5.19	4.87	4.39	**5.71**	**0.02**
Finance paper, 6-month	6.59	6.14	6.20	5.91	5.72	5.75	5.81	5.50	5.34	5.12	4.76	4.31	**5.60**	**-0.09**
Bankers acceptances (3-mo.)	6.96	6.36	6.24	5.92	5.75	5.94	5.89	5.54	5.38	5.21	4.85	4.42	**5.71**	**0.02**
Bankers acceptances (6-mo.)	6.84	6.22	6.21	5.92	5.77	6.00	5.97	5.55	5.42	5.15	4.76	4.28	**5.67**	**-0.01**
CDs, 1-month (secondary)	7.10	6.45	6.47	6.03	5.86	6.00	5.92	5.64	5.47	5.23	4.86	4.84	**5.82**	**0.13**
CDs, 3-month (secondary)	7.17	6.52	6.45	6.06	5.91	6.07	5.98	5.65	5.47	5.33	4.94	4.47	**5.84**	**0.15**
CDs, 6-month (secondary)	7.17	6.51	6.50	6.16	6.03	6.26	6.25	5.79	5.60	5.32	4.92	4.41	**5.91**	**0.22**
Eurodollar deposts-Ldn(1-mo.)	7.13	6.50	6.44	6.03	5.82	5.96	5.90	5.63	5.49	5.21	4.84	4.83	**5.82**	**0.13**
Eurodollar deposts-Ldn(3-mo.)	7.23	6.60	6.44	6.11	5.94	6.08	6.01	5.65	5.50	5.34	4.96	4.48	**5.86**	**0.17**
Eurodollar deposts-Ldn(6-mo.)	7.23	6.58	6.52	6.26	6.07	6.30	6.30	5.82	5.64	5.33	4.93	4.42	**5.95**	**0.26**
Prime Rate	9.52	9.05	9.00	9.00	8.50	8.50	8.50	8.50	8.20	8.00	7.58	7.21	**8.46**	**2.78**
Discount Rate	6.50	6.00	6.00	5.98	5.50	5.50	5.50	5.50	5.20	5.00	4.58	4.11	**5.45**	**-0.24**
T-bill, 3-month (auction avg.)	6.30	5.95	5.91	5.67	5.51	5.60	5.58	5.39	5.25	5.03	4.60	4.12	**5.41**	**-0.28**
T-bill, 6-month (auction avg.)	6.34	5.93	5.91	5.73	5.65	5.76	5.71	5.47	5.29	5.08	4.66	4.16	**5.47**	**-0.21**
T-bill, 1-year (auction avg.)	6.22	5.85	6.06	5.88	5.71	5.73	6.00	5.62	5.26	5.12	4.72	4.20	**5.53**	**-0.16**
T-bill, 3-mo. (auctn avg. invst)	6.49	6.12	6.10	5.84	5.68	5.77	5.76	5.56	5.41	5.18	4.73	4.24	**5.57**	**-0.11**
T-bill, 6-mo. (auctn avg. invst)	6.64	6.20	6.19	6.00	5.91	6.03	5.98	5.72	5.52	5.30	4.85	4.32	**5.72**	**0.03**
T-bill, 3-month (secondary)	6.22	5.94	5.91	5.65	5.46	5.57	5.58	5.33	5.22	4.99	4.56	4.07	**5.38**	**-0.31**
T-bill, 6-month (secondary)	6.28	5.93	5.92	5.71	5.61	5.75	5.70	5.39	5.25	5.04	4.61	4.10	**5.44**	**-0.25**
T-bill, 1-year (secondary)	6.25	5.91	6.00	5.85	5.76	5.96	5.91	5.45	5.26	5.04	4.64	4.17	**5.52**	**-0.17**
T-bond, 1-year (constant)	6.64	6.27	6.40	6.24	6.13	6.36	6.31	5.78	5.57	5.33	4.89	4.38	**5.86**	**0.17**
T-bond, 2-year (constant)	7.13	6.87	7.10	6.95	6.78	6.96	6.92	6.43	6.18	5.91	5.56	5.03	**6.49**	**0.80**
T-bond, 3-year (constant)	7.38	7.08	7.35	7.23	7.12	7.39	7.38	6.80	6.50	6.23	5.90	5.39	**6.81**	**1.13**
T-bond, 5-year (constant)	7.70	7.47	7.77	7.70	7.70	7.94	7.91	7.43	7.14	6.87	6.62	6.19	**7.37**	**1.68**
T-bond, 7-year (constant)	7.97	7.73	8.00	7.92	7.94	8.17	8.15	7.74	7.48	7.25	7.06	6.69	**7.68**	**1.99**
T-bond, 10-year (constant)	8.09	7.85	8.11	8.04	8.07	8.28	8.27	7.90	7.65	7.53	7.42	7.09	**7.86**	**2.17**
T-bond, 30-year (constant)	8.27	8.03	8.29	8.21	8.27	8.47	8.45	8.14	7.95	7.93	7.92	7.70	**8.14**	**2.45**

Difference in Federal Funds		**1991**											
1mo. C-paper less F-funds	0.21	0.28	0.36	0.17	0.13	0.16	0.16	0.06	0.12	0.08	0.14	0.55	**0.20**
1 mo. F-paper less F-funds	0.04	0.06	0.19	0.04	-0.02	0.03	0.04	-0.08	-0.02	-0.03	-0.01	0.26	**0.04**
1 mo. CD's less F-funds	0.19	0.20	0.35	0.12	0.08	0.10	0.10	-0.02	0.02	0.02	0.05	0.41	**0.14**
3 mo. T-bill less F-funds	-0.61	-0.30	-0.21	-0.24	-0.27	-0.30	-0.24	-0.27	-0.20	-0.18	-0.21	-0.31	**-0.28**
6 mo. T-bill less F-funds	-0.57	-0.32	-0.21	-0.18	-0.13	-0.14	-0.11	-0.19	-0.16	-0.13	-0.15	-0.27	**-0.21**
1 yr. T-bill less F-funds	-0.69	-0.40	-0.06	-0.03	-0.07	-0.17	0.18	-0.04	-0.19	-0.09	-0.09	-0.23	**-0.16**

Investment Instruments	Jan.	Feb.	Mar.	Apr.	May	1992 June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	i -- Fed f.
Federal funds	4.03	4.06	3.98	3.73	3.82	3.76	3.25	3.30	3.22	3.10	3.09	2.92	**3.52**	
Commercial paper, 1-month	4.11	4.11	4.28	4.02	3.87	3.91	3.43	3.38	3.25	3.22	3.25	3.71	**3.71**	**0.19**
Commercial paper, 3-month	4.07	4.11	4.30	4.04	3.88	3.92	3.44	3.38	3.24	3.33	3.66	3.67	**3.75**	**0.23**
Commercial paper, 6-month	4.06	4.13	4.38	4.13	3.97	3.99	3.53	3.44	3.26	3.33	3.67	3.70	**3.80**	**0.28**
Finance paper, 1-month	3.99	4.01	4.18	3.89	3.76	3.81	3.33	3.28	3.13	3.14	3.20	3.68	**3.62**	**0.10**
Finance paper, 3-month	3.99	4.02	4.20	3.91	3.77	3.82	3.33	3.27	3.08	3.24	3.59	3.58	**3.65**	**0.13**
Finance paper, 6-month	3.95	3.96	4.15	3.89	3.77	3.80	3.35	3.29	3.11	3.23	3.56	3.52	**3.63**	**0.11**
Bankers acceptances (3-mo.)	3.97	4.00	4.19	3.92	3.76	3.80	3.32	3.28	3.10	3.19	3.51	3.44	**3.62**	**0.10**
Bankers acceptances (6-mo.)	3.96	4.02	4.29	3.99	3.85	3.88	3.42	3.35	3.13	3.19	3.51	3.47	**3.67**	**0.15**
CDs, 1-month (secondary)	4.07	4.05	4.23	3.97	3.79	3.83	3.35	3.29	3.14	3.11	3.23	3.57	**3.64**	**0.11**
CDs, 3-month (secondary)	4.05	4.07	4.25	4.00	3.82	3.86	3.37	3.31	3.13	3.26	3.58	3.48	**3.68**	**0.16**
CDs, 6-month (secondary)	4.07	4.13	4.42	4.13	3.96	3.97	3.50	3.40	3.17	3.27	3.60	3.55	**3.76**	**0.24**
Eurodollar deposts-Ldn(1-mo.)	4.07	4.04	4.21	3.98	3.77	3.81	3.33	3.29	3.14	3.10	3.20	3.56	**3.63**	**0.10**
Eurodollar deposts-Ldn(3-mo.)	4.06	4.05	2.26	4.05	3.84	3.87	3.40	3.33	3.15	3.30	3.67	3.50	**3.54**	**0.02**
Eurodollar deposts-Ldn(6-mo.)	4.08	4.15	4.43	4.19	3.99	4.00	3.54	3.43	3.22	3.32	3.70	3.60	**3.80**	**0.28**
Prime Rate	6.50	6.50	6.50	6.50	6.50	6.50	6.02	6.00	6.00	6.00	6.00	6.00	**6.25**	**2.73**
Discount Rate	3.50	3.50	3.50	3.50	3.50	3.50	3.02	3.00	3.00	3.00	3.00	3.00	**3.25**	**-0.27**
T-bill, 3-month (auction avg.)	3.84	3.84	4.05	3.81	3.66	3.70	3.28	3.14	2.97	2.84	3.14	3.25	**3.46**	**-0.06**
T-bill, 6-month (auction avg.)	3.88	3.94	4.19	3.93	3.78	3.81	3.36	3.23	3.01	2.98	3.35	3.39	**3.57**	**0.05**
T-bill, 1-year (auction avg.)	3.84	4.01	4.37	4.34	4.20	4.07	3.65	3.28	3.02	3.12	3.61	3.57	**3.76**	**0.24**
T-bill, 3-mo. (auctn avg. invst)	3.94	3.95	4.15	3.90	3.75	3.79	3.35	3.21	3.03	2.90	3.21	3.32	**3.54**	**0.02**
T-bill, 6-mo. (auctn avg. invst)	4.03	4.09	4.35	4.07	3.91	3.94	3.46	3.33	3.10	3.07	3.46	3.50	**3.69**	**0.17**
T-bill, 3-month (secondary)	3.80	3.84	4.04	3.75	3.63	3.66	3.21	3.13	2.91	2.86	3.13	3.22	**3.43**	**-0.09**
T-bill, 6-month (secondary)	3.87	3.93	4.18	3.87	3.75	3.77	3.28	3.21	2.96	3.04	3.34	3.36	**3.55**	**0.03**
T-bill, 1-year (secondary)	3.95	4.08	4.40	4.09	3.99	3.98	3.45	3.33	3.06	3.17	3.52	3.55	**3.71**	**0.19**
T-bond, 1-year (constant)	4.15	4.29	4.63	4.30	4.19	4.17	3.60	3.47	3.18	3.30	3.68	3.71	**3.89**	**0.37**
T-bond, 2-year (constant)	4.96	5.21	5.69	5.34	5.23	5.05	4.36	4.19	3.89	4.08	4.58	4.67	**4.77**	**1.25**
T-bond, 3-year (constant)	5.40	5.72	6.18	5.93	5.81	5.60	4.91	4.72	4.42	4.64	5.14	5.21	**5.31**	**1.79**
T-bond, 5-year (constant)	6.24	6.58	6.95	6.78	6.69	6.48	5.84	5.60	5.38	5.60	6.04	6.08	**6.19**	**2.67**
T-bond, 7-year (constant)	6.70	6.96	7.26	7.15	7.06	6.90	6.36	6.12	5.96	6.15	6.49	6.46	**6.63**	**3.11**
T-bond, 10-year (constant)	7.03	7.34	7.54	7.48	7.39	7.26	6.84	6.59	6.42	6.59	6.87	6.77	**7.01**	**3.49**
T-bond, 30-year (constant)	7.58	7.85	7.97	7.96	7.89	7.84	7.60	7.39	4.34	7.53	7.61	7.44	**7.42**	**3.90**

Difference in Federal Funds		1992											
1mo. C-paper less F-funds	0.08	0.05	0.30	0.29	0.05	0.15	0.18	0.08	0.03	0.12	0.16	0.79	**0.19**
1 mo. F-paper less F-funds	-0.04	-0.05	0.20	0.16	-0.06	0.05	0.08	-0.02	-0.09	0.04	0.11	0.76	**0.10**
1 mo. CD's less F-funds	0.04	-0.01	0.25	0.24	-0.03	0.07	0.10	-0.01	-0.08	0.01	0.14	0.65	**0.11**
3 mo. T-bill less F-funds	-0.19	-0.22	0.07	0.08	-0.16	-0.06	0.03	-0.16	-0.25	-0.26	0.05	0.33	**-0.06**
6 mo. T-bill less F-funds	-0.15	-0.12	0.21	0.20	-0.04	0.05	0.11	-0.07	-0.21	-0.12	0.26	0.47	**0.05**
1 yr. T-bill less F-funds	-0.19	-0.05	0.39	0.61	0.38	0.31	0.40	-0.02	-0.20	0.02	0.52	0.65	**0.24**

	1993													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	*i -- Fed f.*
Investment Instruments														
Federal funds	3.02	3.03	3.07	2.96	3.00	3.04	3.06	3.03	3.09	2.99	3.02	2.96	**3.02**	
Commercial paper, 1-month	3.21	3.14	3.15	3.13	3.11	3.19	3.15	3.14	3.14	3.14	3.15	3.35	**3.17**	**0.14**
Commercial paper, 3-month	3.25	3.18	3.17	3.14	3.14	3.25	3.20	3.18	3.16	3.26	3.40	3.36	**3.22**	**0.20**
Commercial paper, 6-month	3.35	3.27	3.24	3.19	3.20	3.38	3.35	3.33	3.25	3.27	3.43	3.40	**3.31**	**0.28**
Finance paper, 1-month	3.25	3.18	3.15	3.06	3.05	3.12	3.08	3.08	3.07	3.08	3.08	3.21	**3.12**	**0.09**
Finance paper, 3-month	3.32	3.27	3.17	3.06	3.07	3.16	3.12	3.13	3.09	3.16	3.25	3.19	**3.17**	**0.14**
Finance paper, 6-month	3.29	3.21	3.14	3.07	3.07	3.16	3.15	3.16	3.11	3.13	3.19	3.18	**3.16**	**0.13**
Bankers acceptances (3-mo.)	3.14	3.06	3.07	3.05	3.06	3.16	3.12	3.10	3.07	3.19	3.29	3.23	**3.13**	**0.11**
Bankers acceptances (6-mo.)	3.23	3.15	3.14	3.10	3.13	3.28	3.26	3.23	3.17	3.19	3.32	3.30	**3.21**	**0.19**
CDs, 1-month (secondary)	3.14	3.08	3.10	3.08	3.07	3.13	3.10	3.09	3.09	3.09	3.11	3.26	**3.11**	**0.09**
CDs, 3-month (secondary)	3.19	3.12	3.11	3.09	3.10	3.21	3.16	3.14	3.12	3.24	3.35	3.26	**3.17**	**0.15**
CDs, 6-month (secondary)	3.33	3.22	3.20	3.16	3.20	3.36	3.34	3.32	3.24	3.25	3.39	3.35	**3.28**	**0.26**
Eurodollar deposts-Ldn(1-mo.)	3.09	3.03	3.06	3.04	3.02	3.09	3.05	3.06	3.05	3.06	3.06	3.22	**3.07**	**0.05**
Eurodollar deposts-Ldn(3-mo.)	3.22	3.12	3.11	3.10	3.12	3.21	3.17	3.14	3.08	3.26	3.36	3.26	**3.18**	**0.16**
Eurodollar deposts-Ldn(6-mo.)	3.37	3.24	3.21	3.21	3.22	3.37	3.37	3.34	3.25	3.26	3.40	3.37	**3.30**	**0.28**
Prime Rate	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	**6.00**	**2.98**
Discount Rate	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	**3.00**	**-0.02**
T-bill, 3-month (auction avg.)	3.06	2.95	2.97	2.89	2.96	3.10	3.05	3.05	2.96	3.04	3.12	3.08	**3.02**	**-0.00**
T-bill, 6-month (auction avg.)	3.17	3.08	3.08	3.00	3.07	3.23	3.15	3.17	3.06	3.13	3.27	3.25	**3.14**	**0.12**
T-bill, 1-year (auction avg.)	3.52	3.32	3.09	3.24	3.13	3.40	3.42	3.30	3.27	3.25	3.43	3.47	**3.32**	**0.30**
T-bill, 3-mo. (auctn avg. invst)	3.13	3.01	3.04	2.94	3.02	3.17	3.12	3.12	3.02	3.10	3.19	3.15	**3.08**	**0.06**
T-bill, 6-mo. (auctn avg. invst)	3.27	3.17	3.17	3.08	3.16	3.33	3.25	3.26	3.15	3.23	3.37	3.35	**3.23**	**0.21**
T-bill, 3-month (secondary)	3.00	2.93	2.95	2.87	2.96	3.07	3.04	3.02	2.95	3.02	3.10	3.06	**3.00**	**-0.02**
T-bill, 6-month (secondary)	3.14	3.07	3.05	2.97	3.07	3.20	3.16	3.14	3.06	3.12	3.26	3.23	**3.12**	**0.10**
T-bill, 1-year (secondary)	3.35	3.25	3.20	3.11	3.23	3.39	3.33	3.30	3.22	3.25	3.42	3.45	**3.29**	**0.27**
T-bond, 1-year (constant)	3.50	3.39	3.33	3.24	3.36	3.54	3.47	3.44	3.36	3.39	3.58	3.61	**3.43**	**0.41**
T-bond, 2-year (constant)	4.39	4.10	3.95	3.84	3.98	4.16	4.07	4.00	3.85	3.87	4.16	4.21	**4.05**	**1.03**
T-bond, 3-year (constant)	4.93	4.58	4.40	4.30	4.40	4.53	4.43	4.36	4.17	4.18	4.50	4.54	**4.44**	**1.42**
T-bond, 5-year (constant)	5.83	5.43	5.19	5.13	5.20	5.22	5.09	5.03	4.73	4.71	5.06	5.15	**5.15**	**2.13**
T-bond, 7-year (constant)	6.26	5.87	5.66	5.59	5.66	5.61	5.48	5.35	5.08	5.05	5.45	5.48	**5.55**	**2.52**
T-bond, 10-year (constant)	6.60	6.26	5.98	5.97	6.04	5.96	5.81	5.68	5.36	5.33	5.72	5.77	**5.87**	**2.85**
T-bond, 30-year (constant)	7.34	7.09	6.82	6.85	6.92	6.81	6.63	6.32	6.00	5.94	6.21	6.25	**6.60**	**3.58**
Difference in Federal Funds		1993												
1mo. C-paper less F-funds	0.19	0.11	0.08	0.17	0.11	0.15	0.09	0.11	0.05	0.15	0.13	0.39	**0.14**	
1 mo. F-paper less F-funds	0.23	0.15	0.08	0.10	0.05	0.08	0.02	0.05	-0.02	0.09	0.06	0.25	**0.10**	
1 mo. CD's less F-funds	0.12	0.05	0.03	0.12	0.07	0.09	0.04	0.06	0.00	0.10	0.09	0.30	**0.09**	
3 mo. T-bill less F-funds	0.04	-0.08	-0.10	-0.07	-0.04	0.06	-0.01	0.02	-0.13	0.05	0.10	0.12	**-0.00**	
6 mo. T-bill less F-funds	0.15	0.05	0.01	0.04	0.07	0.19	0.09	0.14	-0.03	0.14	0.25	0.29	**0.12**	
1 yr. T-bill less F-funds	0.50	0.29	0.02	0.28	0.13	0.36	0.36	0.27	0.18	0.26	0.41	0.51	**0.30**	

	1994													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	*i -- Fed f.*
Investment Instruments														
Federal funds	3.05	3.25	3.34	3.56	4.01	4.25	4.26	4.47	4.73	4.76	5.29	5.45	**4.20**	
Commercial paper, 1-month	3.14	3.39	3.63	3.81	4.28	4.36	4.49	4.65	4.90	5.02	5.40	6.08	**4.43**	**0.23**
Commercial paper, 3-month	3.19	3.49	3.85	4.05	4.57	4.57	4.75	4.84	5.02	5.51	5.81	6.26	**4.66**	**0.46**
Commercial paper, 6-month	3.30	3.62	4.08	4.40	4.92	4.86	5.13	5.19	5.32	5.70	6.01	6.62	**4.93**	**0.73**
Finance paper, 1-month	3.07	3.30	3.53	3.71	4.19	4.27	4.40	4.56	4.79	4.91	5.30	5.93	**4.33**	**0.13**
Finance paper, 3-month	3.11	3.40	3.71	3.94	4.44	4.44	4.64	4.73	4.89	5.36	5.67	6.12	**4.54**	**0.34**
Finance paper, 6-month	3.15	3.39	3.70	4.03	4.45	4.50	4.67	4.79	4.99	5.30	5.58	6.17	**4.56**	**0.36**
Bankers acceptances (3-mo.)	3.10	3.40	3.73	3.96	4.45	4.45	4.65	4.74	4.95	5.41	5.71	6.18	**4.56**	**0.36**
Bankers acceptances (6-mo.)	3.21	3.56	3.96	4.27	4.77	4.73	5.01	5.03	5.24	5.59	5.93	6.53	**4.82**	**0.62**
CDs, 1-month (secondary)	3.08	3.31	3.56	3.75	4.23	4.30	4.45	4.60	4.85	4.98	5.38	6.01	**4.38**	**0.17**
CDs, 3-month (secondary)	3.15	3.43	3.77	4.01	4.51	4.52	4.73	4.81	5.03	5.51	5.79	6.29	**4.63**	**0.43**
CDs, 6-month (secondary)	3.29	3.62	4.03	4.38	4.90	4.85	5.15	5.17	5.40	5.79	6.11	6.78	**4.96**	**0.75**
Eurodollar deposts-Ldn(1-mo.)	3.03	3.27	3.50	3.71	4.18	4.27	4.43	4.57	4.82	4.96	5.36	5.99	**4.34**	**0.14**
Eurodollar deposts-Ldn(3-mo.)	3.15	3.43	3.75	4.00	4.51	4.51	4.74	4.80	5.01	5.52	5.78	6.27	**4.62**	**0.42**
Eurodollar deposts-Ldn(6-mo.)	3.30	3.62	4.02	4.37	4.88	4.85	5.15	5.16	5.38	5.77	6.10	6.77	**4.95**	**0.75**
Prime Rate	6.00	6.00	6.06	6.45	6.99	7.25	7.25	7.51	7.75	7.75	8.15	8.50	**7.14**	**2.94**
Discount Rate	3.00	3.00	3.00	3.00	3.24	3.50	3.50	3.76	4.00	4.00	4.40	4.75	**3.60**	**-0.61**
T-bill, 3-month (auction avg.)	3.02	3.21	3.52	3.74	4.19	4.18	4.39	4.50	4.64	4.96	5.25	5.64	**4.27**	**0.07**
T-bill, 6-month (auction avg.)	3.19	3.38	3.79	4.13	4.64	4.58	4.81	4.91	5.02	5.39	5.69	6.21	**4.65**	**0.44**
T-bill, 1-year (auction avg.)	3.52	3.59	4.03	4.30	4.77	5.03	5.20	5.36	5.38	5.72	6.09	6.75	**4.98**	**0.78**
T-bill, 3-mo. (auctn avg. invst)	3.08	3.28	3.60	3.83	4.30	4.29	4.50	4.61	4.76	5.09	5.40	5.80	**4.38**	**0.18**
T-bill, 6-mo. (auctn avg. invst)	3.29	3.49	3.92	4.27	4.81	4.75	4.99	5.11	5.22	5.63	5.94	6.50	**4.83**	**0.62**
T-bill, 3-month (secondary)	2.98	3.25	3.50	3.68	4.14	4.14	4.33	4.48	4.62	4.95	5.29	5.60	**4.25**	**0.04**
T-bill, 6-month (secondary)	3.15	3.43	3.78	4.09	4.60	4.55	4.75	4.88	5.04	5.39	5.72	6.21	**4.63**	**0.43**
T-bill, 1-year (secondary)	3.39	3.69	4.11	4.57	5.03	4.98	5.17	5.25	5.43	5.75	6.13	6.67	**5.01**	**0.81**
T-bond, 1-year (constant)	3.54	3.87	4.32	4.82	5.31	5.27	5.48	5.56	5.76	6.11	6.54	7.14	**5.31**	**1.11**
T-bond, 2-year (constant)	4.14	4.47	5.00	5.55	5.97	5.93	6.13	6.18	6.39	6.73	7.15	7.59	**5.94**	**1.73**
T-bond, 3-year (constant)	4.48	4.83	5.40	5.99	6.34	6.27	6.48	6.50	6.69	7.04	7.44	7.71	**6.26**	**2.06**
T-bond, 5-year (constant)	5.09	5.40	5.94	6.52	6.78	6.70	6.91	6.88	7.08	7.40	7.72	7.78	**6.68**	**2.48**
T-bond, 7-year (constant)	5.43	5.72	6.28	6.80	7.01	6.91	7.12	7.06	7.28	7.58	7.83	7.80	**6.90**	**2.70**
T-bond, 10-year (constant)	5.75	5.97	6.48	6.97	7.18	7.10	7.30	7.24	7.46	7.74	7.96	7.81	**7.08**	**2.88**
T-bond, 30-year (constant)	6.29	6.49	6.91	7.27	7.41	7.40	7.58	7.49	7.71	7.94	8.08	7.87	**7.37**	**3.17**
Difference in Federal Funds		**1994**												
1mo. C-paper less F-funds	0.09	0.14	0.29	0.25	0.27	0.11	0.23	0.18	0.17	0.26	0.11	0.63	**0.23**	
1 mo. F-paper less F-funds	0.02	0.05	0.19	0.15	0.18	0.02	0.14	0.09	0.06	0.15	0.01	0.48	**0.13**	
1 mo. CD's less F-funds	0.03	0.06	0.22	0.19	0.22	0.05	0.19	0.13	0.12	0.22	0.09	0.56	**0.17**	
3 mo. T-bill less F-funds	-0.03	-0.04	0.18	0.18	0.18	-0.07	0.13	0.03	-0.09	0.20	-0.04	0.19	**0.07**	
6 mo. T-bill less F-funds	0.14	0.13	0.45	0.57	0.63	0.33	0.55	0.44	0.29	0.63	0.40	0.76	**0.44**	
1 yr. T-bill less F-funds	0.47	0.34	0.69	0.74	0.76	0.78	0.94	0.89	0.65	0.96	0.80	1.30	**0.78**	

APPENDIX B: COMPARISON OF INTEREST RATES OF SELECT INSTRUMENTS

	1995													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average	*i - Fed f.*
Investment Instruments														
Federal funds	5.53	5.92	5.98										**5.81**	
Commercial paper, 1-month	5.86	6.05	6.07										**5.99**	**0.18**
Commercial paper, 3-month	6.22	6.15	6.15										**6.17**	**0.36**
Commercial paper, 6-month	6.63	6.38	6.30										**6.44**	**0.63**
Finance paper, 1-month	5.76	5.95	5.95										**5.89**	**0.08**
Finance paper, 3-month	6.10	6.04	6.03										**6.06**	**0.25**
Finance paper, 6-month	6.25	6.10	6.04										**6.13**	**0.32**
Bankers acceptances (3-mo.)	6.12	6.05	6.04										**6.07**	**0.26**
Bankers acceptances (6-mo.)	6.45	6.22	6.14										**6.27**	**0.46**
CDs, 1-month (secondary)	5.84	6.01	6.02										**5.96**	**0.15**
CDs, 3-month (secondary)	6.24	6.16	6.15										**6.18**	**0.37**
CDs, 6-month (secondary)	6.71	6.44	6.34										**6.50**	**0.69**
Eurodollar deposts-Ldn(1-mo.)	5.82	5.99	6.03										**5.95**	**0.14**
Eurodollar deposts-Ldn(3-mo.)	6.23	6.14	6.15										**6.17**	**0.36**
Eurodollar deposts-Ldn(6-mo.)	6.70	6.43	6.35										**6.49**	**0.68**
Prime Rate	8.50	9.00	9.00										**8.83**	**3.02**
Discount Rate	4.75	5.25	5.25										**5.08**	**-0.73**
T-bill, 3 month (auction avg.)	5.81	5.80	5.73										**5.78**	**-0.03**
T-bill, 6-month (auction avg.)	6.31	6.10	5.91										**6.11**	**0.30**
T-bill, 1-year (auction avg.)	6.86	6.59	6.16										**6.54**	**0.73**
T-bill, 3-mo. (auctn avg. invst)	5.98	5.97	5.91										**5.95**	**0.14**
T-bill, 6-mo. (auctn avg. invst)	6.60	6.38	6.19										**6.39**	**0.58**
T-bill, 3 month (secondary)	5.71	5.77	5.73										**5.74**	**-0.07**
T-bill, 6 month (secondary)	6.21	6.03	5.89										**6.04**	**0.23**
T-bill, 1 year (secondary)	6.59	6.28	6.03										**6.30**	**0.49**
T-bond, 1-year (constant)	7.05	6.70	6.43										**6.73**	**0.92**
T-bond, 2-year (constant)	7.51	7.11	6.78										**7.13**	**1.32**
T-bond, 3-year (constant)	7.66	7.25	6.89										**7.27**	**1.46**
T-bond, 5-year (constant)	7.76	7.37	7.05										**7.39**	**1.58**
T-bond, 7-year (constant)	7.79	7.44	7.14										**7.46**	**1.65**
T-bond, 10-year (constant)	7.78	7.47	7.20										**7.48**	**1.67**
T-bond, 30-year (constant)	7.85	7.61	7.45										**7.64**	**1.83**
Difference in Federal Funds		**1995**												
1mo. C-paper less F-funds	0.36	0.10	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.04**	
1 mo. F-paper less F-funds	0.24	-0.01	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.02**	
1 mo. CD's less F-funds	0.38	0.11	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.05**	
3 mo. T-bill less F-funds	0.45	0.05	-0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.03**	
6 mo. T-bill less F-funds	1.00	0.54	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.14**	
1 yr. T-bill less F-funds	0.12	-0.08	-0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**-0.01**	

Appendix C

DAILY REVENUE AND DISBURSEMENT STUDY OF WEST VIRGINIA STATE GOVERNMENT

(Source: Legislative Auditor's Office's Budget and Fiscal Division)

State of West Virginia
General Revenue Fund Daily from July 1, 1992

DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
07/01/92	1,655,239.52	23,500.00	1.42%
07/02/92	3,190,495.13	2,114.00	0.07%
07/06/92	2,459,217.33	0.00	0.00%
07/07/92	2,914,974.22	26,740.00	0.92%
07/08/92	2,247,887.71	440.00	0.02%
07/09/92	2,862,195.59	3,654,973.51	127.70%
07/10/92	2,027,162.24	2,608,656.18	128.69%
07/13/92	2,775,997.68	9,230,444.84	332.51%
07/14/92	7,038,093.96	3,172,785.84	45.08%
07/15/92	12,310,271.52	222,890.79	1.81%
07/16/92	6,626,890.64	691,549.57	10.44%
07/17/92	11,427,399.24	11,045,364.13	96.66%
07/20/92	14,412,761.66	6,263,277.25	43.46%
07/21/92	18,124,998.93	16,235,784.78	89.58%
07/22/92	9,492,087.36	9,624,788.44	101.40%
07/23/92	4,497,341.05	1,882,879.80	41.87%
07/24/92	4,504,272.99	11,671,500.81	259.12%
07/27/92	1,967,944.14	9,604,866.32	488.07%
07/28/92	7,050,365.00	9,978,785.87	141.54%
07/29/92	5,932,090.98	1,129,368.59	19.04%
07/30/92	4,379,845.24	9,060,228.59	206.86%
07/31/92	2,499,053.56	3,321,258.60	132.90%
08/03/92	13,781,050.75	738,012.39	5.36%
08/04/92	3,053,134.48	0.00	0.00%
08/05/92	6,312,907.37	35.00	0.00%
08/06/92	1,951,193.99	17,275.00	0.89%
08/07/92	1,939,537.12	10,206.48	0.53%
08/10/92	4,085,694.04	15,852,584.72	388.00%
08/11/92	2,333,157.10	8,301,951.11	355.82%
08/12/92	5,630,146.48	3,066,895.43	54.47%
08/13/92	4,408,169.37	1,032,263.41	23.42%
08/14/92	6,210,085.83	944,681.46	15.21%
08/17/92	13,356,977.55	30,707,115.93	229.90%
08/18/92	15,026,456.90	710,846.09	4.73%
08/19/92	13,076,118.95	1,093,713.17	8.36%
08/20/92	11,673,833.20	18,922,878.61	162.10%
08/21/92	10,430,321.36	4,571,834.32	43.83%

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DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
08/24/92	5,618,872.14	8,030,771.43	142.92%
08/25/92	5,944,753.60	13,233,365.44	222.61%
08/26/92	1,913,037.36	1,993,332.61	104.20%
08/27/92	1,478,793.85	1,490,447.89	100.79%
08/28/92	2,146,926.52	281,687.74	13.12%
08/31/92	6,779,030.51	13,902,533.27	205.08%
09/01/92	8,822,409.31	588,586.31	6.67%
09/02/92	7,360,642.05	1,148,617.32	15.60%
09/03/92	4,438,860.82	320,199.35	7.21%
09/04/92	2,190,523.48	97,992.12	4.47%
09/08/92	2,401,101.39	12,396,912.12	516.30%
09/09/92	2,958,997.06	5,082,776.10	171.77%
09/10/92	4,511,260.82	11,701,297.48	259.38%
09/11/92	5,275,147.59	3,616,549.45	68.56%
09/14/92	6,903,513.57	1,795,342.87	26.01%
09/15/92	11,040,146.75	33,539,672.58	303.80%
09/16/92	11,768,104.60	315,036.86	2.68%
09/17/92	11,588,695.88	1,185,482.07	10.23%
09/18/92	17,625,336.38	7,414,267.38	42.07%
09/21/92	16,566,813.87	36,019,636.23	217.42%
09/22/92	22,731,127.34	1,380,725.04	6.07%
09/23/92	16,195,761.60	2,569,179.65	15.86%
09/24/92	8,756,406.29	1,521,959.15	17.38%
09/25/92	5,795,616.18	18,173,519.14	313.57%
09/28/92	5,074,701.42	7,399,603.86	145.81%
09/29/92	4,821,563.99	2,707,552.63	56.16%
09/30/92	5,619,515.97	21,238,357.12	377.94%
10/01/92	10,616,510.47	0.00	0.00%
10/02/92	8,526,360.69	0.00	0.00%
10/05/92	3,983,866.49	0.00	0.00%
10/06/92	2,671,804.26	5,943.44	0.22%
10/07/92	2,225,678.35	360,860.00	16.21%
10/08/92	1,787,465.10	11,190.94	0.63%
10/09/92	2,138,604.40	4,618,430.90	215.96%
10/13/92	5,418,275.77	9,478,005.44	174.93%
10/14/92	9,459,206.19	4,477,547.28	47.34%
10/15/92	6,186,634.17	30,443,897.52	492.09%

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DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
10/16/92	8,982,384.25	100,852.83	1.12%
10/19/92	15,855,178.46	6,301,521.55	39.74%
10/20/92	15,434,211.74	25,730,541.37	166.71%
10/21/92	16,564,650.67	761,903.72	4.60%
10/22/92	7,450,222.13	3,211,168.41	43.10%
10/23/92	15,540,381.97	10,337,109.34	66.52%
10/26/92	4,284,035.37	22,058,078.55	514.89%
10/27/92	4,635,716.17	4,867,070.99	104.99%
10/28/92	1,663,600.35	9,347,428.75	561.88%
10/29/92	5,976,713.42	3,649,458.95	61.06%
10/30/92	6,166,898.71	19,803,592.62	321.13%
11/02/92	1,829,311.72	51,000.00	2.79%
11/04/92	17,280,363.62	1,033,559.57	5.98%
11/05/92	11,941,321.70	5,545,961.57	46.44%
11/06/92	2,812,574.68	241,907.11	8.60%
11/09/92	4,777,393.62	13,634,189.61	285.39%
11/10/92	2,553,011.55	8,551,461.63	334.96%
11/12/92	6,716,929.19	2,886,465.02	42.97%
11/13/92	5,768,354.91	6,842,059.91	118.61%
11/16/92	17,827,142.57	30,109,140.74	168.89%
11/17/92	12,982,691.78	451,729.48	3.48%
11/18/92	20,911,450.87	797,652.25	3.81%
11/19/92	11,852,813.12	3,263,258.47	27.53%
11/20/92	6,406,367.23	37,512,525.78	585.55%
11/23/92	11,419,109.12	5,364,860.62	46.98%
11/24/92	(2,883,004.35)	3,821,606.09	-132.56%
11/25/92	1,734,818.20	17,101,352.20	985.77%
11/30/92	10,632,974.25	17,306,673.38	162.76%
12/01/92	12,925,438.15	1,305,750.78	10.10%
12/02/92	8,565,951.83	1,000,339.08	11.68%
12/03/92	5,343,971.32	1,864,201.09	34.88%
12/04/92	428,696.54	446,451.71	104.14%
12/07/92	2,581,012.13	6,599,702.32	255.70%
12/08/92	2,388,774.95	2,776,618.18	116.24%
12/09/92	2,604,079.12	4,264,256.44	163.75%
12/10/92	2,420,026.57	7,513,315.03	310.46%
12/11/92	5,002,118.50	8,051,303.67	160.96%

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DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
12/14/92	14,280,190.49	418,036.10	2.93%
12/15/92	12,130,724.65	31,249,010.96	257.60%
12/16/92	13,743,543.54	312,124.22	2.27%
12/17/92	16,770,950.58	1,328,216.89	7.92%
12/18/92	27,787,534.43	26,329,316.70	94.75%
12/21/92	9,638,313.25	6,093,756.06	63.22%
12/22/92	9,719,682.50	3,658,900.12	37.64%
12/23/92	6,431,084.83	7,683,130.25	119.47%
12/24/92	5,015,481.51	256,573.05	5.12%
12/28/92	(638,664.82)	18,256,817.03	-2858.59%
12/29/92	2,380,642.51	2,826,408.27	118.72%
12/30/92	4,103,844.69	7,652,148.05	186.46%
12/31/92	3,265,316.78	12,662,325.12	387.78%
01/04/93	23,177,501.22	886,895.06	3.83%
01/05/93	8,850,158.55	1,490,637.79	16.84%
01/06/93	3,641,892.74	817,901.10	22.46%
01/07/93	3,208,839.67	334,795.41	10.43%
01/08/93	1,348,642.61	5,742,885.99	425.83%
01/11/93	1,006,431.68	3,814,353.05	379.00%
01/12/93	5,313,749.39	8,498,564.89	159.94%
01/13/93	4,103,655.99	19,298,759.92	470.28%
01/14/93	5,718,407.10	1,619,026.78	28.31%
01/15/93	4,476,813.28	32,856,359.40	733.92%
01/19/93	9,012,820.70	927,003.85	10.29%
01/20/93	24,165,382.36	30,139,748.85	124.72%
01/22/93	13,047,393.26	15,988,712.14	122.54%
01/25/93	6,667,416.24	17,399,257.98	260.96%
01/26/93	6,167,884.74	10,194,488.33	165.28%
01/27/93	6,676,564.87	4,550,248.62	68.15%
01/28/93	11,223,406.20	2,932,045.18	26.12%
01/29/93	2,654,681.93	25,945,101.44	977.33%
02/01/93	28,190,137.20	7,619,809.52	27.03%
02/02/93	27,635,171.15	3,349,682.99	12.12%
02/03/93	11,971,515.01	422,132.37	3.53%
02/04/93	16,204,319.60	12,898,078.90	79.60%
02/05/93	22,883,696.51	5,781,164.24	25.26%
02/08/93	7,599,732.55	4,142,834.21	54.51%

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DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
02/09/93	3,507,048.24	11,700,175.69	333.62%
02/10/93	3,060,227.66	557,175.71	18.21%
02/11/93	2,899,024.71	8,433,977.19	290.92%
02/16/93	16,089,064.31	31,414,537.95	195.25%
02/17/93	18,494,429.16	1,220,372.08	6.60%
02/18/93	12,088,008.30	688,633.16	5.70%
02/19/93	14,319,358.65	4,366,076.46	30.49%
02/22/93	11,664,136.20	33,966,085.00	291.20%
02/23/93	4,780,167.53	11,777,930.73	246.39%
02/24/93	5,041,241.01	817,880.48	16.22%
02/25/93	1,258,540.58	22,026,330.43	1750.15%
02/26/93	(5,036,272.06)	21,428,931.25	-425.49%
03/01/93	18,134,350.02	4,958,130.84	27.34%
03/02/93	8,627,401.68	230,800.71	2.68%
03/03/93	4,204,388.21	255,147.32	6.07%
03/04/93	10,255,918.31	627,964.05	6.12%
03/05/93	5,847,967.55	3,995,202.31	68.32%
03/08/93	3,917,711.40	489,385.33	12.49%
03/09/93	2,369,094.27	5,751,263.52	242.76%
03/10/93	5,386,277.27	16,118,886.23	299.26%
03/11/93	5,536,431.05	5,286,728.21	95.49%
03/12/93	8,132,005.32	2,033,088.88	25.00%
03/15/93	4,449,302.70	30,876,721.92	693.97%
03/16/93	12,648,924.18	463,012.13	3.66%
03/17/93	16,864,729.66	5,887,207.31	34.91%
03/18/93	12,794,749.14	850,150.57	6.64%
03/19/93	16,358,934.63	513,771.26	3.14%
03/22/93	17,089,813.91	28,150,403.82	164.72%
03/23/93	8,877,398.69	2,824,470.32	31.82%
03/24/93	6,016,434.46	6,317,819.16	105.01%
03/25/93	816,363.53	19,842,954.72	2430.65%
03/26/93	1,277,476.87	2,345,034.19	183.57%
03/29/93	(2,961,989.62)	5,011,449.91	-169.19%
03/30/93	1,467,292.20	17,546,324.32	1195.83%
03/31/93	1,167,086.66	2,225,120.69	190.66%
04/01/93	14,439,524.62	559,051.74	3.87%
04/02/93	8,998,249.50	1,633,638.77	18.16%

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04/05/93	7,121,846.10	4,441,674.79	62.37%
04/06/93	4,821,798.84	8,143,302.55	168.89%
04/07/93	3,335,445.01	2,823,350.45	84.65%
04/08/93	3,154,084.48	7,281,079.99	230.85%
04/09/93	2,353,672.92	6,402,657.56	272.03%
04/12/93	5,384,131.76	1,243,480.04	23.10%
04/13/93	10,569,643.88	24,551,532.48	232.28%
04/14/93	9,491,552.94	1,888,624.53	19.90%
04/15/93	14,497,452.07	41,223,460.65	284.35%
04/16/93	19,075,341.64	564,484.19	2.96%
04/19/93	22,261,134.63	409,060.31	1.84%
04/20/93	29,121,833.55	40,506,994.09	139.09%
04/21/93	21,311,512.74	1,676,194.96	7.87%
04/22/93	8,007,370.24	972,703.31	12.15%
04/23/93	9,182,328.34	7,716,323.55	84.03%
04/26/93	9,046,076.52	23,507,485.64	259.86%
04/27/93	4,683,965.95	10,038,454.53	214.32%
04/28/93	3,381,069.29	2,675,182.72	79.12%
04/29/93	3,896,587.91	580,884.59	14.91%
04/30/93	14,658,375.78	25,640,559.16	174.92%
05/03/93	23,389,451.96	932,866.49	3.99%
05/04/93	7,138,429.21	349,898.47	4.90%
05/05/93	8,072,117.18	1,240,496.97	15.37%
05/06/93	2,760,608.75	6,680,045.11	241.98%
05/07/93	2,938,342.08	3,836,026.67	130.55%
05/10/93	4,047,531.99	5,254,720.43	129.83%
05/11/93	1,979,997.31	12,794,508.54	646.19%
05/12/93	5,301,333.59	2,686,030.45	50.67%
05/13/93	4,735,754.16	2,307,759.86	48.73%
05/14/93	12,369,046.47	904,407.65	7.31%
05/17/93	11,759,999.88	38,790,459.43	329.85%
05/18/93	22,536,084.75	1,453,290.84	6.45%
05/19/93	12,729,637.69	927,141.31	7.28%
05/20/93	8,136,097.74	39,654,509.53	487.39%
05/21/93	7,852,524.08	2,983,505.91	37.99%
05/24/93	6,991,532.87	4,351,991.20	62.25%
05/25/93	2,563,555.85	27,935,875.83	1089.73%

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05/26/93	723,146.15	6,528,168.11	902.75%
05/27/93	1,862,255.10	19,052,945.15	1023.11%
05/31/93	4,318,447.56	13,248,116.99	306.78%
06/01/93	14,283,075.38	3,064,080.91	21.45%
06/02/93	4,874,543.80	173,607.66	3.56%
06/03/93	4,646,451.56	(289,278.69)	-6.23%
06/04/93	5,257,637.14	3,231,241.15	61.46%
06/07/93	3,470,527.45	808,016.52	23.28%
06/08/93	2,927,175.00	4,712,352.87	160.99%
06/09/93	2,437,784.51	3,985,348.48	163.48%
06/10/93	4,124,196.47	12,881,249.63	312.33%
06/11/93	4,711,782.39	2,094,834.05	44.46%
06/14/93	16,473,045.19	9,672,416.86	58.72%
06/15/93	22,021,759.93	37,846,407.48	171.86%
06/16/93	20,909,275.55	1,643,218.37	7.86%
06/17/93	29,762,910.63	346,620.40	1.16%
06/18/93	25,357,769.36	1,174,899.95	4.63%
06/22/93	18,858,446.68	38,522,090.09	204.27%
06/23/93	18,624,206.81	1,297,718.99	6.97%
06/24/93	9,015,988.76	5,095,734.70	56.52%
06/25/93	8,856,070.29	25,205,733.92	284.62%
06/28/93	876,122.93	9,157,654.49	1045.25%
06/29/93	(7,191,591.41)	2,092,964.79	-29.10%
06/30/93	6,310,311.94	26,964,010.08	427.30%
07/01/93	4,498,422.04	0.00	0.00%
07/02/93	3,300,283.23	0.00	0.00%
07/06/93	2,994,771.70	1,350.00	0.05%
07/07/93	2,534,356.00	36,767.71	1.45%
07/08/93	1,707,474.75	76,754.63	4.50%
07/09/93	2,107,926.92	7,446,999.03	353.29%
07/12/93	5,595,263.90	801,236.37	14.32%
07/13/93	5,342,324.94	6,040,627.21	113.07%
07/14/93	5,851,654.65	8,852,592.93	151.28%
07/15/93	6,077,757.76	2,196,817.97	36.15%
07/16/93	6,095,418.18	1,079,669.80	17.71%
07/19/93	12,630,673.47	13,285,058.65	105.18%
07/20/93	20,047,714.18	8,429,714.20	42.05%

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07/21/93	16,998,206.68	26,531,641.37	156.08%
07/22/93	10,342,723.28	1,096,771.47	10.60%
07/23/93	9,848,204.35	8,837,925.65	89.74%
07/26/93	4,142,503.16	14,560,706.62	351.50%
07/27/93	7,967,489.46	6,011,035.73	75.44%
07/28/93	4,265,809.41	7,071,096.70	165.76%
07/29/93	1,475,290.74	2,907,892.14	197.11%
07/30/93	2,481,938.89	4,478,843.79	180.46%
07/31/93	(153,817.25)	8,015,221.81	-5210.87%
08/02/93	15,460,620.09	601,909.70	3.89%
08/03/93	8,463,925.23	0.00	0.00%
08/04/93	3,715,213.90	175.00	0.00%
08/05/93	4,130,440.39	0.00	0.00%
08/06/93	5,092,750.27	9,528,754.16	187.10%
08/09/93	3,869,158.37	1,985,575.50	51.32%
08/10/93	2,863,094.33	5,052,260.85	176.46%
08/11/93	2,860,863.90	18,946,083.86	662.25%
08/12/93	7,034,416.63	1,483,642.34	21.09%
08/13/93	6,574,542.57	817,304.37	12.43%
08/16/93	11,515,870.37	25,037,450.33	217.42%
08/17/93	17,348,869.96	664,141.17	3.83%
08/18/93	12,315,881.83	614,775.41	4.99%
08/19/93	15,336,775.06	439,189.53	2.86%
08/20/93	7,794,004.85	20,182,762.61	258.95%
08/23/93	9,914,674.44	2,856,632.63	28.81%
08/24/93	7,984,789.59	3,531,775.50	44.23%
08/25/93	2,605,751.12	14,203,248.47	545.07%
08/26/93	(618,126.23)	6,791,422.73	-1098.71%
08/27/93	2,527,092.11	7,402,676.72	292.93%
08/30/93	3,095,026.37	15,445,958.68	499.06%
08/31/93	3,053,978.46	2,287,819.47	74.91%
09/01/93	8,082,984.39	770,741.79	9.54%
09/02/93	8,621,059.37	3,560,444.60	41.30%
09/03/93	11,835,588.81	529,131.36	4.47%
09/07/93	4,410,019.69	784,198.29	17.78%
09/08/93	3,228,415.92	1,211,518.40	37.53%
09/09/93	1,313,075.58	1,581,472.03	120.44%

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09/10/93	3,337,237.93	22,225,792.73	665.99%
09/13/93	6,945,377.43	4,133,814.81	59.52%
09/14/93	10,766,638.34	1,748,908.44	16.24%
09/15/93	8,456,785.87	34,095,465.09	403.17%
09/16/93	13,035,879.85	7,263,449.03	55.72%
09/17/93	14,546,443.50	810,112.14	5.57%
09/20/93	20,733,718.39	35,132,581.94	169.45%
09/21/93	23,015,856.35	2,428,463.05	10.55%
09/22/93	26,526,296.16	3,629,166.19	13.68%
09/23/93	12,741,208.15	2,083,783.56	16.35%
09/24/93	5,759,636.12	8,673,444.85	150.59%
09/27/93	7,369,395.12	19,823,530.99	269.00%
09/28/93	6,283,803.02	7,239,636.61	115.21%
09/29/93	2,372,581.90	222,968.49	9.40%
09/30/93	4,694,195.69	24,671,045.10	525.56%
10/01/93	12,634,984.45	0.00	0.00%
10/04/93	9,901,023.58	64,292.02	0.65%
10/05/93	2,699,293.08	9,975,894.96	369.57%
10/06/93	2,395,962.71	1,222,620.97	51.03%
10/07/93	1,599,061.10	901,576.18	56.38%
10/08/93	1,286,026.66	4,381,659.26	340.71%
10/12/93	4,533,094.05	12,971,992.66	286.16%
10/13/93	5,869,508.21	6,588,232.13	112.25%
10/14/93	9,238,376.95	2,483,289.41	26.88%
10/15/93	289,703.86	29,052,977.51	10028.51%
10/18/93	20,032,999.57	7,712,734.19	38.50%
10/19/93	21,503,508.72	341,339.66	1.59%
10/20/93	11,422,037.26	25,244,818.36	221.02%
10/21/93	17,094,345.66	580,937.33	3.40%
10/22/93	4,185,396.96	5,717,374.36	136.60%
10/25/93	8,153,500.33	3,148,381.18	38.61%
10/26/93	3,143,084.07	23,574,894.92	750.06%
10/27/93	4,209,762.22	2,520,167.49	59.86%
10/28/93	2,281,889.77	1,215,739.08	53.28%
10/29/93	18,182,638.22	20,069,482.14	110.38%
11/01/93	11,614,239.19	2,122,697.49	18.28%
11/02/93	8,222,713.81	1,598,177.97	19.44%

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11/03/93	4,164,508.47	1,142,702.90	27.44%
11/04/93	6,202,438.00	1,351,956.16	21.80%
11/05/93	1,857,685.39	3,340,861.66	179.84%
11/08/93	933,202.17	24,321,435.95	2606.23%
11/09/93	2,072,687.93	3,118,329.24	150.45%
11/10/93	2,392,183.54	766,737.32	32.05%
11/12/93	4,765,265.29	2,493,928.48	52.34%
11/15/93	11,027,828.05	36,462,957.00	330.64%
11/16/93	13,919,932.24	2,844,611.07	20.44%
11/17/93	14,285,071.89	184,438.72	1.29%
11/18/93	13,872,206.39	1,523,918.57	10.99%
11/19/93	17,890,660.16	2,686,882.58	15.02%
11/22/93	7,842,146.63	32,728,179.92	417.34%
11/23/93	7,167,810.88	9,149,355.76	127.65%
11/24/93	4,247,119.60	2,357,950.81	55.52%
11/29/93	8,365,048.01	13,576,713.80	162.30%
11/30/93	4,813,466.95	20,033,266.97	416.19%
12/01/93	10,825,116.27	1,039,011.94	9.60%
12/02/93	6,959,130.99	1,006,553.46	14.46%
12/03/93	3,074,741.04	4,578,003.86	148.89%
12/06/93	110,044.09	1,509,228.44	1371.48%
12/07/93	7,739,381.16	5,124,823.13	66.22%
12/08/93	2,853,322.21	9,291,834.32	325.65%
12/09/93	(941,822.76)	4,104,613.88	-435.82%
12/10/93	2,629,487.28	5,295,733.07	201.40%
12/13/93	12,741,282.86	10,689,009.59	83.89%
12/14/93	9,179,557.90	602,514.12	6.56%
12/15/93	9,916,101.97	27,579,914.74	278.13%
12/16/93	16,078,976.90	521,203.53	3.24%
12/17/93	8,195,127.89	269,553.21	3.29%
12/20/93	20,531,606.39	32,736,466.42	159.44%
12/21/93	31,696,962.68	625,068.74	1.97%
12/22/93	786,412.22	5,016,939.61	637.95%
12/23/93	7,161,308.62	7,267,238.39	101.48%
12/27/93	4,502,231.27	18,671,751.16	414.72%
12/28/93	2,473,000.41	4,091,161.71	165.43%
12/29/93	6,627,458.67	414,837.33	6.26%

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12/30/93	3,706,647.38	19,489,401.42	525.80%
12/31/93	10,685.26	(1,940.55)	-18.16%
01/03/94	23,961,477.68	253,195.81	1.06%
01/05/94	6,067,502.67	299,901.97	4.94%
01/06/94	3,557,653.22	705,594.31	19.83%
01/07/94	3,685,689.35	11,566,085.27	313.81%
01/10/94	4,333,731.19	2,361,556.93	54.49%
01/11/94	4,199,320.80	8,589,707.17	204.55%
01/12/94	3,691,288.27	11,597,122.48	314.18%
01/13/94	5,355,897.67	11,928,379.41	222.71%
01/14/94	5,459,112.29	1,245,866.11	22.82%
01/18/94	99,239.87	30,737,173.84	30972.61%
01/19/94	16,338,483.54	27,500,892.01	168.32%
01/20/94	13,896,046.19	1,521,992.71	10.95%
01/21/94	21,756,244.67	766,754.81	3.52%
01/24/94	13,599,420.58	684,896.24	5.04%
01/25/94	10,363,900.93	20,302,307.29	195.89%
01/26/94	4,938,817.70	5,047,282.08	102.20%
01/27/94	7,094,191.57	13,199,472.49	186.06%
01/28/94	11,151,526.69	10,210,540.37	91.56%
01/31/94	16,708,178.09	16,177,846.15	96.83%
02/01/94	19,587,233.35	5,656,433.91	28.88%
02/02/94	12,897,819.31	1,372,404.91	10.64%
02/03/94	19,652,813.76	619,610.30	3.15%
02/04/94	10,837,258.32	6,759,836.12	62.38%
02/07/94	4,392,488.27	16,938,532.59	385.62%
02/08/94	(59,710.04)	9,699,295.68	-16243.99%
02/09/94	(2,466,736.10)	3,296,046.89	-133.62%
02/10/94	1,109,253.82	4,376,654.31	394.56%
02/14/94	6,610,480.40	846,792.11	12.81%
02/15/94	8,353,177.45	30,754,861.00	368.18%
02/16/94	10,038,218.60	1,383,843.84	13.79%
02/17/94	12,753,293.90	6,856,162.92	53.76%
02/18/94	14,136,797.69	1,609,339.24	11.38%
02/22/94	14,733,391.34	33,935,571.05	230.33%
02/23/94	9,119,941.76	5,754,980.04	63.10%
02/24/94	6,809,621.01	3,230,945.32	47.45%

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02/25/94	4,136,163.49	8,505,845.98	205.65%
02/28/94	12,480,094.71	24,052,250.37	192.72%
03/01/94	11,842,491.17	2,620,316.11	22.13%
03/02/94	5,199,775.07	1,311,213.38	25.22%
03/03/94	3,800,762.88	13,590,115.30	357.56%
03/04/94	9,765,512.49	4,154,797.31	42.55%
03/07/94	10,170,183.08	4,378,546.18	43.05%
03/08/94	3,181,164.53	5,492,817.14	172.67%
03/09/94	1,052,661.60	2,253,109.55	214.04%
03/10/94	1,465,442.64	20,383,849.95	1390.97%
03/11/94	4,383,665.30	3,504,613.82	79.95%
03/14/94	14,490,609.96	1,122,210.87	7.74%
03/15/94	11,806,141.50	30,144,315.93	255.33%
03/16/94	9,903,112.05	6,606,066.02	66.71%
03/17/94	15,449,137.93	599,843.47	3.88%
03/18/94	24,879,400.96	981,404.49	3.94%
03/21/94	16,813,923.50	27,872,813.59	165.77%
03/22/94	17,869,507.96	1,104,998.67	6.18%
03/23/94	21,792.12	1,797,299.43	8247.47%
03/24/94	3,452,567.69	5,013,426.46	145.21%
03/25/94	1,728,433.38	24,854,490.99	1437.98%
03/28/94	2,725,067.25	3,696,992.74	135.67%
03/29/94	(880,504.56)	955,861.10	-108.56%
03/30/94	3,723,811.73	7,976,860.63	214.21%
03/31/94	5,478,567.94	2,956,035.84	53.96%
04/01/94	10,625,905.52	13,357,184.62	125.70%
04/04/94	13,605,945.24	4,484,596.92	32.96%
04/05/94	2,891,970.66	300,236.79	10.38%
04/06/94	2,817,419.82	1,490,535.65	52.90%
04/07/94	(750,302.59)	12,869,773.17	-1715.28%
04/08/94	3,764,511.64	8,859,259.08	235.34%
04/11/94	6,865,056.93	6,136,042.45	89.38%
04/12/94	7,342,741.70	8,751,702.43	119.19%
04/13/94	8,874,120.56	7,600,615.65	85.65%
04/14/94	9,491,632.89	1,929,772.70	20.33%
04/15/94	10,650,959.37	37,731,298.48	354.25%
04/18/94	21,756,146.65	251,174.02	1.15%

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04/19/94	13,085,287.11	553,571.63	4.23%
04/20/94	30,235,980.97	44,335,755.79	146.63%
04/21/94	24,164,391.36	4,021,178.25	16.64%
04/22/94	15,259,784.52	2,865,801.63	18.78%
04/25/94	9,731,948.45	24,526,562.39	252.02%
04/26/94	11,867,528.38	10,489,615.20	88.39%
04/27/94	7,670,914.52	3,141,519.05	40.95%
04/28/94	7,280,718.97	5,123,320.03	70.37%
04/29/94	17,493,363.98	14,762,368.78	84.39%
05/02/94	9,639,005.00	17,832,477.63	185.00%
05/03/94	19,989,924.87	4,392,095.52	21.97%
05/04/94	4,404,218.06	1,956,584.35	44.43%
05/05/94	4,114,327.08	(584,081.29)	-14.20%
05/06/94	6,685,559.72	5,899,075.29	88.24%
05/09/94	4,860,113.88	7,059,060.08	145.24%
05/11/94	6,210,702.78	18,144,125.53	292.14%
05/12/94	6,415,088.78	2,357,454.76	36.75%
05/13/94	7,954,571.81	1,071,535.74	13.47%
05/16/94	11,719,794.52	6,300,610.43	53.76%
05/17/94	17,199,413.07	38,138,741.11	221.74%
05/18/94	19,798,579.43	1,052,598.34	5.32%
05/19/94	10,948,991.91	453,198.99	4.14%
05/20/94	8,502,785.73	42,328,401.71	497.82%
05/23/94	6,087,404.30	5,154,347.45	84.67%
05/24/94	5,581,925.96	9,871,855.86	176.85%
05/25/94	1,492,259.59	22,195,111.84	1487.35%
05/26/94	1,062,399.45	1,439,597.12	135.50%
05/27/94	2,982,387.38	696,815.62	23.36%
05/31/94	9,971,830.86	30,569,777.48	306.56%
06/01/94	11,077,517.67	2,905,052.83	26.22%
06/02/94	9,030,110.99	3,736,078.53	41.37%
06/03/94	2,206,187.91	389,463.57	17.65%
06/06/94	2,139,391.41	893,420.94	41.76%
06/07/94	2,749,467.18	15,377,126.73	559.28%
06/08/94	3,352,003.20	2,656,980.33	79.27%
06/09/94	2,353,782.58	7,039,142.28	299.06%
06/10/94	3,211,902.71	3,626,292.71	112.90%

State of West Virginia
General Revenue Fund Daily from July 1, 1992

DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
06/13/94	12,157,938.83	935,452.33	7.69%
06/14/94	13,177,937.85	7,576,013.01	57.49%
06/15/94	13,331,378.47	39,792,382.98	298.49%
06/16/94	21,314,996.22	823,547.22	3.86%
06/17/94	25,788,041.96	1,970,375.90	7.64%
06/21/94	19,921,885.03	2,442,700.98	12.26%
06/22/94	24,084,663.09	37,965,903.64	157.64%
06/23/94	5,367,636.36	2,299,790.67	42.85%
06/24/94	3,163,170.62	9,031,056.83	285.51%
06/27/94	36,992,527.17	21,538,333.06	58.22%
06/28/94	11,011,507.90	8,122,924.25	73.77%
06/29/94	5,636,305.73	17,978,723.15	318.98%
06/30/94	3,879,789.81	13,177,105.78	339.63%
07/01/94	2,232,166.93	0.00	0.00%
07/05/94	2,319,638.07	0.00	0.00%
07/06/94	4,438,003.79	6,239.21	0.14%
07/07/94	3,008,344.52	673,377.56	22.38%
07/08/94	2,671,245.49	176,294.01	6.60%
07/11/94	4,339,152.01	6,712,168.16	154.69%
07/12/94	3,243,056.37	11,740,109.53	362.01%
07/13/94	9,576,064.65	10,352,980.76	108.11%
07/14/94	8,263,269.71	2,523,785.27	30.54%
07/15/94	5,291,931.48	413,709.27	7.82%
07/18/94	10,197,294.95	669,483.47	6.57%
07/19/94	18,139,319.79	18,511,258.87	102.05%
07/20/94	12,704,801.77	3,943,655.64	31.04%
07/21/94	11,498,232.91	26,903,584.88	233.98%
07/22/94	12,743,706.11	2,560,002.64	20.09%
07/25/94	13,132,510.78	29,483,000.69	224.50%
07/26/94	9,710,983.79	12,554,149.63	129.28%
07/27/94	13,650,694.16	5,886,332.29	43.12%
07/28/94	4,101,212.91	677,891.49	16.53%
07/30/94	7,461,698.43	25,219,634.29	337.99%
08/01/94	15,020,910.43	357,938.33	2.38%
08/02/94	9,200,082.61	178,600.52	1.94%
08/03/94	4,124,768.25	6,341,322.62	153.74%
08/04/94	6,968,860.38	142,969.44	2.05%

State of West Virginia
General Revenue Fund Daily from July 1, 1992

DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
08/05/94	2,379,654.21	190,212.58	7.99%
08/08/94	2,966,123.68	969,068.07	32.67%
08/09/94	5,068,965.82	10,289,110.52	202.98%
08/10/94	2,875,727.42	6,226,404.89	216.52%
08/11/94	3,291,290.24	8,829,331.07	268.26%
08/12/94	5,117,100.26	1,294,443.84	25.30%
08/15/94	11,771,421.04	188,005.64	1.60%
08/16/94	14,510,825.74	27,784,197.27	191.47%
08/17/94	15,893,196.67	165,139.25	1.04%
08/18/94	14,092,047.22	3,863,028.70	27.41%
08/19/94	11,526,769.21	2,821,612.03	24.48%
08/22/94	10,405,993.24	28,431,446.53	273.22%
08/23/94	8,636,486.61	816,918.69	9.46%
08/24/94	2,497,820.67	10,282,427.25	411.66%
08/25/94	5,599,416.22	6,208,682.17	110.88%
08/26/94	2,063,786.05	22,528,445.53	1091.61%
08/29/94	3,161,041.01	763,559.60	24.16%
08/30/94	2,573,713.84	20,966,124.38	814.63%
08/31/94	1,808,604.90	47,798.44	2.64%
09/01/94	11,096,821.55	714,805.21	6.44%
09/02/94	11,726,380.21	1,038,858.32	8.86%
09/06/94	8,614,020.38	5,848,843.58	67.90%
09/07/94	5,672,281.88	323,024.45	5.69%
09/08/94	3,185,643.15	6,351,184.74	199.37%
09/09/94	3,187,974.63	1,821,178.45	57.13%
09/12/94	7,975,418.81	11,040,430.68	138.43%
09/13/94	6,994,429.56	3,550,322.07	50.76%
09/14/94	5,871,638.67	6,987,453.27	119.00%
09/15/94	12,505,188.29	27,802,849.02	222.33%
09/16/94	7,019,904.80	291,451.65	4.15%
09/19/94	13,296,166.92	648,549.36	4.88%
09/20/94	16,669,126.87	25,228,515.88	151.35%
09/21/94	15,459,644.77	613,608.57	3.97%
09/22/94	21,970,764.08	7,033,284.28	32.01%
09/23/94	18,293,786.93	3,332,877.67	18.22%
09/26/94	13,265,086.58	23,361,419.22	176.11%
09/27/94	11,289,035.06	6,688,982.93	59.25%

State of West Virginia
General Revenue Fund Daily from July 1, 1992

DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
09/28/94	6,647,167.87	20,603,150.84	309.95%
09/29/94	5,656,378.86	1,278,759.12	22.61%
09/30/94	5,812,960.94	969,806.67	16.68%
10/03/94	19,838,393.60	1,140,948.66	5.75%
10/04/94	8,414,908.17	1,721,570.63	20.46%
10/05/94	5,521,593.61	5,929,841.68	107.39%
10/06/94	2,730,422.25	2,099,150.20	76.88%
10/07/94	2,500,766.06	4,059,324.75	162.32%
10/11/94	(1,006,064.92)	12,466,419.38	-1239.13%
10/12/94	5,021,020.50	12,084,824.07	240.68%
10/13/94	7,200,898.75	1,096,167.56	15.22%
10/14/94	5,139,131.69	1,407,701.10	27.39%
10/17/94	13,859,671.79	29,102,031.85	209.98%
10/18/94	12,001,960.07	5,105,620.79	42.54%
10/19/94	14,551,868.27	3,662,382.98	25.17%
10/20/94	12,326,335.34	3,075,346.25	24.95%
10/21/94	10,870,626.49	30,156,318.37	277.41%
10/24/94	16,291,927.02	4,150,699.70	25.48%
10/25/94	47,469.42	22,901,081.68	48243.86%
10/26/94	20,083,369.11	4,118,027.03	20.50%
10/27/94	4,593,983.51	8,275,090.23	180.13%
10/28/94	4,164,814.80	566,576.74	13.60%
10/31/94	5,445,689.58	9,408,991.55	172.78%
11/01/94	24,224,558.56	13,275,924.03	54.80%
11/02/94	3,667,273.92	161,637.83	4.41%
11/03/94	12,999,685.24	5,587,173.45	42.98%
11/04/94	7,741,516.26	2,822,343.61	36.46%
11/07/94	3,305,190.92	21,741,763.76	657.81%
11/09/94	2,951,828.45	9,189,043.72	311.30%
11/10/94	4,329,240.51	1,060,943.25	24.51%
11/14/94	4,154,695.37	700,799.03	16.87%
11/15/94	12,464,360.57	33,274,827.22	266.96%
11/16/94	16,275,664.75	3,014,249.17	18.52%
11/17/94	7,750,866.67	542,216.41	7.00%
11/18/94	11,926,459.30	1,592,034.76	13.35%
11/21/94	18,800,482.17	25,926,200.60	137.90%
11/22/94	13,252,091.00	16,498,179.57	124.49%

State of West Virginia
General Revenue Fund Daily from July 1, 1992

DATE	GEN REVENUE AMOUNT RECEIVED	GEN REVENUE AMOUNT DISBURSED	DAILY DISBURSEMENTS AS A % OF RECEIPTS
11/23/94	8,213,215.65	10,171,110.08	123.84%
11/28/94	5,548,832.80	16,964,869.28	305.74%
11/29/94	7,456,056.55	1,158,862.90	15.54%
11/30/94	(2,634,575.82)	19,789,527.54	-751.15%
12/01/94	14,008,661.81	1,587,047.57	11.33%
12/02/94	6,676,944.97	5,459,569.02	81.77%
12/05/94	11,756,545.45	673,229.11	5.73%
12/06/94	6,620,880.19	1,439,168.01	21.74%
12/07/94	2,574,215.60	4,067,851.27	158.02%
12/08/94	1,503,294.14	4,347,064.27	289.17%
12/09/94	4,088,600.02	2,641,778.03	64.61%
12/12/94	6,146,880.47	10,169,920.89	165.45%
12/13/94	7,830,699.31	5,609,901.57	71.64%
12/14/94	8,917,452.30	525,624.09	5.89%
12/15/94	7,784,254.31	32,063,324.00	411.90%
12/16/94	14,751,545.39	3,601,237.43	24.41%
12/19/94	14,826,380.48	1,148,233.32	7.74%
12/20/94	30,771,627.91	25,918,665.86	84.23%
12/21/94	17,030,057.14	842,012.99	4.94%
12/22/94	13,771,571.96	4,554,025.10	33.07%
12/23/94	7,447,112.50	13,733,377.30	184.41%
12/27/94	2,210,723.26	21,281,277.45	962.64%
12/28/94	6,466,779.22	1,209,869.20	18.71%
12/29/94	6,681,425.26	1,258,751.20	18.84%

Appendix D

OTHER STATES' USE OF REPURCHASE AGREEMENTS

State	Repos as a Percent of Operating Portfolio
Alabama	15%
Alaska	5%
Arizona	5%
California	2%
Colorado	8%
Connecticut	3%
Delaware	5%
Florida	5%
Idaho	26%
Illinois	23%
Indiana	11%
Iowa	5%
Kansas	0%
Kentucky	23%
Louisiana	10%
Maine	10%
Maryland	70%
Massachusetts	80%
Michigan	0%
Minnesota	10%
Mississippi	11%
Nebraska	1%
Nevada	14%
New Hampshire	33%
New Jersey	0%
New York	77%
Ohio	2%
Rhode Island	65%
South Dakota	0%
Vermont	34%
Virginia	10%
Washington	7%
Wisconsin	34%
Wyoming	5%
Total Average	17.39%

Appendix E

AGENCY RESPONSE

State of West Virginia
Board of Investments
Suite E-122
State Capitol
Charleston, WV 25305
Telephone: (304) 558-5000
Telefax: (304) 344-9284

July 5, 1995

RECEIVED
JUL 05 1995
RESEARCH AND PERFORMANCE
EVALUATION DIVISION

Antonio E. Jones, Ph.D.
Director
Performance Evaluation and Research Division
West Virginia Legislature
Building 5, Room 751A
State Capitol Complex
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0592

Dear Dr. Jones:

Thank you for the performance report entitled "Excessive Liquidity, Fiduciary Responsibilities and Management Fees". I appreciate the opportunity to respond to the report in writing before it has been finalized.

First, I would note that I am pleased that the concerns highlighted in your report were the only issues you considered significant enough to comment on. Given the breath of the Board's operations, by exclusion your comments suggest that the Board's performance has generally been outstanding. In fact, your primary criticism is that the Board has been too conservative, or cautious, at a time when we have received some criticism that the Board was attempting to venture too far afield in its investment policies.

That is not to say, that I agree with everything in the report. I do, however, agree with the principle focus - that the Board has maintained too much liquidity in the Consolidated Fund. I disagree as to some of the details in that regard, with the conclusion about liquidity in the Consolidated Pension Fund and some of the discussion with regard to fiduciary responsibility.

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Before I address individual recommendations, I believe that it is important to discuss what I believe is a fundamental misunderstanding about the nature of repurchase agreements as investment vehicles. The main concern I have with the report is the classification of repurchase agreements ("repo") as an instrument used only for cash needs. While cash flows do mandate the lowest amount of repo needed in any one fund, market conditions dictate the upper limits. To provide a broader perspective to this issue I have attached letters from two of the pension fund advisors explaining their position on cash reserves. Investment Advisers, Inc. stresses that cash is invested as investment opportunities arise, while Kemper Asset Management Company states that they usually have between 3% and 5% in cash as a company investment policy, but will go as high as 10% when market conditions warrant it. In the Consolidated Pension Fund, 4% amounts to $140 million and 10% amounts to approximately $350 million. This shows that the pension funds have been near or below what I consider to be industry standards. On a more detailed level I note that your report says that repurchase agreements do not earn as much as longer securities. That is true if you only look at coupon interest. Attachment #2 to this letter shows five securities with differing maturities and coupons. If the Board had invested $500 million in each security on December 31, 1993, and then analyzed the portfolio on December 31, 1994, one year later, it would have found that repo (with a conservatively estimated coupon) earned the most money. That's what happens in a falling market environment. Moreover, over the last couple of weeks, the Board's repos have earned from 5.9% to 6.14%, averaging 6.02%. To earn the same amount in coupon (not taking into consideration the effect of compounding) one would have to go out 2.5 to 6 years in maturity. (See Attachment #3.) The money market funds are not allowed to buy securities with maturities that long. If our advisors believe that the market is going to improve, they would probably want to lock in a rate, even if it was currently lower than the repo. However, if the advisor believes that the market is still in a bear trend, as many of them do, they would leave the majority of their short term assets in repurchase agreements to earn more interest and not have to worry about the negative market impact.

Questioning the advisors' decisions with regard to the amount of repo is fine, but it should be done within the big picture. The Board believes that overall performance is a better measure of how well the advisor is handling the portfolio. As long as that performance meets the standards the Board has set, it is unwise to question individual investment decisions. For example, Investment Advisers, Inc.'s performance on both the Public Employees' Retirement System and the Workers' Compensation Fund over seven years has put them in the top quartile of all advisors. Our current money market advisors have outperformed the Donahue Average Money Market Index over the last three quarters, which means that they are beating over 50% of the other money market funds. This suggests to us that the advisors' allocation to repo has not hurt their performance but has actually helped returns.

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Another problem I have with the report in general is its view of the Consolidated Fund as a consolidated portfolio. The Consolidated Fund is actually made up of several portfolios which are kept distinct and separate from each other. Some are money market portfolios, some are not. The investment guidelines applicable to each were adopted for very good reasons. That is not to say that some adjustment could not be made to some of the individual portfolios. In fact, we agree, as your report recommends, that the guidelines for the Enhanced Yield Pool should be reconsidered. Looking at the Consolidated Fund portfolios as a whole, however, and saying that it's guidelines should be broadened is too simplistic.

Given the above, I have commented on each recommendation below:

Recommendation #1 - We agree with this recommendation and will do more in this regard. I would add, also, that another great help would be for the State to mandate that all collection and disbursements made by the State of $50,000.00 or more be done electronically. As the report stated, monthly tax collections trickle in during a 2 to 3 day time period at the beginning and at the middle of the month. This is a very critical time period for cash flows out (i.e. State payroll) if the majority of the tax collections come in on the 3rd day and the clearing of large disbursements takes place on the 2nd day. This produces a significant one day dip in assets that would be eliminated with the better coordination made possible by electronic transfers.

Recommendation #2 - I disagree with this recommendation. The staff has always provided all the information it has on disbursements and collections and will continue to do so. If we are able to develop or obtain more information, it will be provided as we get it. Moreover, this recommendation suggests that we actually tell the advisors at what maturity levels they should invest in, etc. If we are going to do that we might as well do it ourselves. Frankly, our staff could probably do it, but the Board has determined that they would rather hire advisors. If that is the choice, then the advisors should be given the leeway to invest as they see fit. Our job is to monitor them.

Recommendation #3 - I do not agree with this recommendation. Money market rules are mandated by the SEC for money market funds for a very important reason. They ensure the safety of the type of money invested on a short-term basis. The issue should be whether the money we have allocated to money market funds should be moved to a mutual fund type pool. This can be done to a limited extent (see Recommendation #4) but some participants in our pool do not want the risk associated with a mutual fund structure.

Recommendation #4 - We agree in principle with this recommendation. In fact, we had already made plans to increase the level of the Enhanced Yield Pool and currently plan to take it up to $100 million over the next few months.

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Recommendation #5 - I agree.

Recommendation #6 - I agree.

Recommendation #7 - I disagree with amending West Virginia Code §12-6-5(9). This is action that should be taken at the Board level rather than the legislative level. One of our contentions all along is that the financial markets and arrangements supporting those markets are constantly changing. This is the sort of detail that is subject to change. It requires the flexibility that a legislative mandate does not provide. In any event, the fact that the Board already mandated the staff use a delivery versus payment type of repurchase agreement prior to the Legislative Auditor's review, makes it a moot point. In addition, we are currently trying to develop the more lucrative tri-party arrangement but are running into trouble with the Attorney General's requirement that the contract not fall under the law of any other state. We believe that the difference in lost interest is between $600,000.00 and $1 million per year.

Recommendation #8 - I agree.

Recommendation #9 - I agree.

Again, thank you for the opportunity to respond in writing prior to the submission of the report to the legislature.

Sincerely,

H. Craig Slaughter
Executive Director

HCS/bkj

Attachments

IAI

Larry R. Hill, CFA
Senior Vice President
(612) 376-2770

November 5, 1991

Diana Will
Director of Investments
State of West Virginia
The State Capitol, Suite E147
Charleston, West Virginia 25305

RE: Cash reserve levels in PERS and Workers' Compensation

Dear Diana:

IAI's current fixed income strategy is to be fully invested with only minimal levels of cash reserves. Today's low short term interest rates don't provide any incentive to hold a permanent level of cash.

In maintaining a fully invested position, we generally allow cash to accumulate until we find a good investment opportunity. The decision to invest is based upon market conditions and not the timing of the cash flow. We believe that waiting for the right investment results in better long term performance. Although cash is sometimes invested immediately, we also may wait as long as two months for the right investment conditions. Thus reserves may temporarily build until they are permanently invested.

Cash receipts and reserve levels are carefully analyzed and monitored as part of our investment process. In the PERS portfolio, for example, total interest and principal payments exceed $110 annually but they are received unevenly during the year. Interest payments alone in August and February exceed $16 million per month, in October and April almost $15 million is received each month. We know when the money is coming in, but we may not like the market at that time.

Cash management is more complicated in the Workers' Compensation Fund because of the premiums that are paid into the fund and the benefits that are paid out. The cash generally comes into the fund during the first two months and is paid out in the last month of each quarter. It is best to keep this money invested in short term securities to avoid the possibility of selling longer assets at a loss in order to make benefit payments. This need for extra liquidity results in a higher cash level. Cash received from the investment portfolio is put to work with the same strategy as in PERS.

In summary, we don't believe that a permanent commitment to cash reserves is appropriate except when needed to meet anticipated payments such as the benefit payments in the Workers' Compensation Fund. Cash receipts are invested when we see good opportunities, not when the cash is received. Although this does result in some temporary cash assets, we believe it produces better long term investment performance.

Sincerely,

Larry R. Hill

120 South LaSalle Street
Chicago, Illinois 60603

(312) 781 6871
(312) 499 8364 Fax

Kemper Asset Management

January 28, 1992

Mr. Robert Jones
Chief Investment Officer
State of West Virginia
State Capitol Building, Room E120
Charleston, WV 25305

Dear Bob:

I am writing in response to your request to outline Kemper Asset Management's investment policy with respect to the use of cash reserves. Inherent in the firm's intermediate bond management philosophy is a proclivity to run fully invested portfolios. While fully invested means different things to different people, we view a 3-5 percent cash reserve position as a fully invested portfolio in an operational sense. Occasionally, we may raise as much as 10% cash in order to facilitate a duration or sector move. For example, in the beginning of January we sold U.S. treasuries in order to shorten portfolio durations, and for future corporate and mortgage opportunities. This type of move is fairly atypical, and in an ongoing analysis you should view our use of cash as normally in the 3-5% range.

If you need further clarification please give me a call at (312) 917-8868.

Best regards,

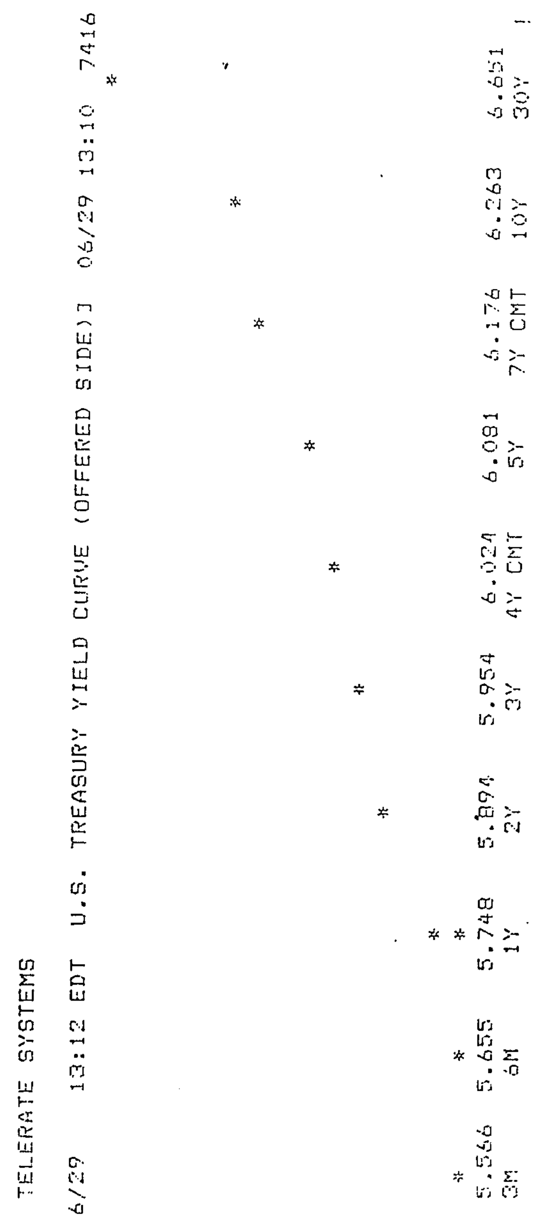
CHRIS

Christopher T. Vincent, C.F.A.
Vice President

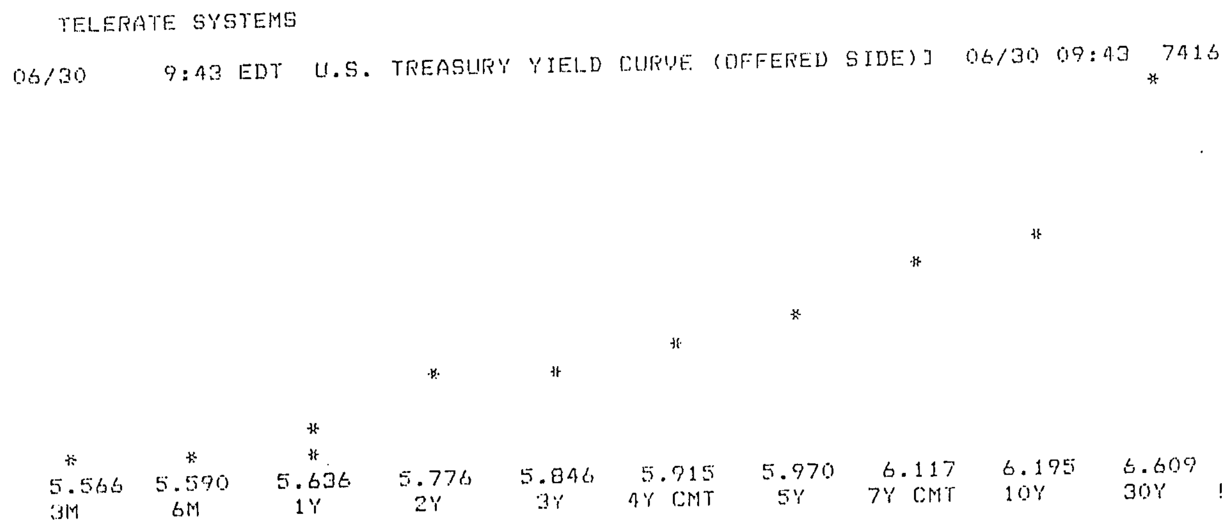
			PRICE 12/31/93	PRICE 12/31/94	PAR VALUE	COUPON EARNINGS	MARKET EARNINGS	TOTAL EARNINGS
TBONDS	8.125	08/15/2019	119.094	101.313	419,836,431.73	34,111,710.08	(74,651,115.93)	(40,539,405.85)
STRIPS	0.000	02/15/09	36.906	32.906	1,354,793,258.55	0.00	(54,191,730.34)	(54,191,730.34)
TBONDS	11.625	11/15/04	145.219	125.25	344,307,563.06	40,025,754.21	(68,754,777.27)	(28,729,023.06)
TNOTES	4.625	08/15/95	100.875	98.594	495,662,949.19	22,924,411.40	(11,306,071.87)	11,618,339.53
REPO	3.250	1 DAY	100	100	500,000,000.00	16,250,000.00	0.00	16,250,000.00

Attachment #2

Attachment 3



Attachment #3


TELERATE SYSTEMS
06/30 9:43 EDT U.S. TREASURY YIELD CURVE (OFFERED SIDE)] 06/30 09:43 7416
5.566
3M
5.590
6M
5.636
1Y
5.776
2Y
5.846
3Y
5.915
4Y CMT
5.970
5Y
6.117
7Y CMT
6.195
10Y
6.609
30Y

FRIDAY, JULY 14, 1995

Charleston Daily Mail

Review panel cites investment problems

Board's director says many of the criticisms are insignificant

THE ASSOCIATED PRESS

Most of a review panel's criticisms of Board of Investment procedures are insignificant considering the work the board does, said Executive Director Craig Slaughter.

The panel's report said board policies prevent the state from making as much interest money as it could and that state law forces the board to overcharge state agencies for investing their money.

The investment board invests about $4.6 billion in public funds, of which $3.3 billion is pension fund money, according to a draft performance review the Legisla-

tain amount of cash, he said.

The amount of liquidity in the pension fund is 4 percent of the portfolio, exactly the national norm, Slaughter said.

Recently, the type of short-term investments the state makes actually have yielded more revenue than the long-term investments the report recommended, Slaughter said.

One reason liquidity is high is because the board wants to project an image of financial responsibility after the state lost about $300 million in investment funds in 1987.

Short-term investments are safer, the report acknowledged.

Slaughter said long-term investments suffer when the market drops. A client agency could lose money if it needs to sell an asset while the market is down. Also, financial reports might reflect a negative balance for some assets

Tony Copy

REFERENCE SHEET

Agency Under Review: BOI Issue 2+3

Compliance Review No. ______

SRC Analyst: John Silvia

Recommendation No. ______

Referencer: Michael Midkiff

Date Received: ______
Date Returned: ______
Date Resolved: ______
Date Approved: ______

Review Manager: ______

Referencer's Comments | Analysts Response | Resolving Party's Initials

Page 15
1. Paragraph 1 Foot Note 53 (1st half of sentence seems off from what cod says (maybe minor point)
2. Para 1 Footnote 54 Does not say for benifit of pension beneficiaries
3. Para 2 Footnote 56 / Cannot Find in memos that this is the Richest tax / K1 alludes to this but is not definite
4. Para 2 Footnote / could be construed as mishandling
4. Para 2 FN 57/A3 does not say this.
5. Para 2 FN 58 Last Sentence / I5 does not say Generally it says in specific locations
6. Para 4 FN 60 / Def in Source conflicts. IT says payment should be. Your Def says Requires
7. Para 5 FN 61 / Do Not see how this def was derived from this memo
8. Page 16 Para 1 FN 62 / Do not see how this def was derived from this source
9. Para 3 1st Sentence / No documentation
10. Para 3 5th Sentence / Do not see documented cases
11. Para 4 FN 69 / Does not mention Lower interest Rates
12. Para 5 / No documentation
13. Para 6 / Should Refer to [illegible]
This issue does not seem to tie together. 1st statement separate / No Cause effect.

ISSUE 3

Page 18 Para 2 / Is this statement a conclusion based on this spread sheet?

2. Para 3 FN 77 / Could Not Find Rule 6.2
Para 3 FN 78 / Only states 1% not 1.20%
Page 19 Para 1 FN 82 / Get the idea that earnings are volitile but No documentation that charges have little realationship
Para 1 FN 83 / Cannot Find D1

CR 14 Form\Jan 89

Issue Area 2: The Board Of Investments Should Use Greater Diligence in Carrying Out Its Fiduciary Responsibilities

A 1988 State Supreme Court case, *Dadisman versus Moore*, resulted in the statement that the Board of Investment is a fiduciary of state pension beneficiaries.[53] The legislative intent of the Board's statute also indicates that the Board's investment responsibilities are for the benefit of pension beneficiaries.[54] Furthermore, the Board must consider the needs of the pension fund participants in its policies, and its investment practices must be performed with the highest standards of care.[55] The conclusion of this review indicates that the Board has not given sufficient consideration to its fiduciary responsibilities.

Repurchase Agreements

For several years, the Board of Investments has entered into repurchase agreements using a method considered to be the riskiest way.[56] For more than two years, the Board has invested close to $1 billion daily in repurchase agreements.[57] A repurchase agreement (repo) is an arrangement where one party agrees to lend another party a certain amount of money. The borrower gives the lender securities as collateral under the agreement that the securities will be "repurchased" by the borrower from the lender for the amount of the loan with a specified interest payment. Thus, the lender has made a collateralized loan and receives the principal amount back with interest. Generally, repos are overnight loans.[58]

There are three ways that a repo can be arranged. Each way hinges on how the collateral is handled.[59] These three ways are briefly described below:

> **"Delivery-versus-Payment (DVP)":** This method requires the borrower to first deliver collateral to the lender's custodial bank before the money is transferred to the borrower. This ensures that the lender has the collateral "in-hand". If the borrower defaults on the loan, the lender can sell the collateral to regain the principal amount. The cost of this method is highest of the three methods because of the costs incurred by both parties to deliver the collateral and transfer the funds. However, the risk is the lowest of the three methods because the lender has possession of the collateral.[60]

> **"Tri-party":** This method works similarly to DVP, except that a third party is responsible for receiving the collateral for the lender and transferring the funds to the borrower. The advantage is that the third party usually is the borrower's custodial bank. This cuts down on the delivery costs because the custodial bank already has custody of the borrower's securities. Also, the third party is responsible for the paperwork associated with providing that the collateral is what the lender can accept and has the proper value. This method has lower transaction costs than DVP and the risks are lower than hold-in-custody.[61]

Awkward sentence

"Hold-in-Custody": This method allows the collateral to be held or set aside by the borrower in an account for the lender. There are no transaction costs because the borrower keeps possession of the securities. This method generally has the highest rate of return of the three methods, but it has the highest risk because the lender does not have possession of the collateral.[62] agree it says this

The Board had been using the hold-in-custody method for several years until March 22, 1995.[63] At that time the Board decided to do all of its repos using the DVP arrangement. This change in policy was prompted by a recommendation made in the Bear Stearns report which was released in December 1994.[64] Given the fact that over half of the state's General Revenue fund is invested in repos on any given day, the change in policy greatly reduced an unnecessary risk to the state's operating and pension funds. Conclusion

An advisor for BOI talked to the staff about perfecting interest in its repos since 1990. The Board's staff and the Governor (who chairs the Board) were again informed in a March 1992 memo.[65] The memo stressed the importance of perfecting a security interest in the collateral. In fact, the advisor attached an article to his memo to illustrate to the Board the reality of the risk. The article documented recent cases in which investors lost their investment in repurchase agreements because lenders did not have a perfected interest in the collateral. The article also issued a statement from Standard & Poor's which concluded that:

> "...the risk of hold-in-custody arrangements is unacceptable for S&P's highest ratings...."[66] agree

When — The Board did respond to the advisor's concern by trying to enter into a tri-party arrangement.[67] However, the contract was disapproved by the state's Attorney General because the governing law of the agreement would have been New York's law.[68] This means that if a repo went bad, BOI would have to rely on New York's legal system. The reason the Board did not pursue an agreement using West Virginia's law was that third parties would either not agree to the arrangement under that condition or they offered lower interest rates.[69]

After the Attorney General disapproved the tri-party contract, the Board was faced with a decision of whether to continue with the hold-in-custody method, or use DVP. The Board decided to continue using hold-in-custody.

Awkward — The PERD was interested to see how other states invest in repos. Out of the fifty states the PERD contacted by telephone, 34 state treasurer offices responded. Table 7 shows the results. A large majority of the states that responded take possession of the collateral when entering into a repurchase agreement.[70]

TABLE 7

How Other States Do Repurchase Agreements

	Delivery vs Payment	Tri-Party	Hold in Custody
Number of States	25	4	5
DVP:	Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Idaho, Illinois, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Nebraska, Nevada, New Jersey, New York, South Dakota, Virginia, Washington, Wisconsin, Wyoming		
Tri-Party:	Alabama (Alabama law), Kentucky (New York law), Minnesota (New York law), Rhode Island (Rhode Island law)		
Hold in Custody:	Indiana, New Hampshire, Ohio, Vermont		

Source: Results of a telephone survey conducted by the West Virginia Legislative Auditor's Office, Performance Evaluation and Research Division

For several years, the risks of repurchase agreements have been a concern of public officials responsible for investing.[71] The Government Finance Officers Association issued its official statement on repos in 1986.[72] It affirmed the use of repos as a viable investment instrument, but it acknowledged the risk by stating that:

> Proper collateralization practices are necessary to protect the public funds invested in repurchase agreements. Risk is significantly reduced by delivery of underlying securities through physical delivery or safekeeping with the purchaser's custodian. (Emphasis added)[73]

The same investment advisor who informed the Board in 1990 of the risk, told the PERD that for a while BOI was the largest investor on Wall Street that did not have a perfected interest in the collateral of its repurchase agreements.[74]

Recommendation 7

The Legislature should consider amending WVC 12-6-5(9) to require that the Board of Investments use Delivery-versus-Payment or Tri-Party arrangements in conducting repurchase agreements.

ISSUE AREA 3: Management Fees

The Board of Investments is authorized to " . . . make a charge against the earnings of the various funds managed by the board for all necessary expenses of the board. The charge shall be on a pro-rata basis of actual earnings of the various funds managed by the board. The charge shall be deposited to the credit of the general revenue fund" (§12-6-6a). 75

Awkward **This language has the unintended effect of causing the funds to be overcharged.** The Board has complied with the law in the manner it makes this charge. However, the way the statute is written which requires the charge to be against actual earnings, it is difficult to avoid charging an amount that ~~is either~~ over or under the Board's actual costs. 76

Each fiscal year, the Board receives an appropriation from the General Revenue Fund for budgeted expenses. By rule, the Board makes a monthly charge against the actual earnings of the various funds within the Consolidated Fund and the Consolidated Pension Fund. 77 The fee has generally been 1% to 1.25% of earnings. 78 These charges are subsequently credited to the General Fund. 79 West Virginia Code §12-6-6a is intended to reimburse the General Fund for the Board's actual operating costs. This mechanism allows the state and local governments to pay the costs associated with investing their funds, and the pension funds to pay for their respective share of the costs. ?

During the past four fiscal years, the Board has charged service fees totalling $1,358,497 above its actual expenses. This is illustrated in Table 8. In terms of asset composition, the Consolidated Pension Fund represents 72% of the total portfolio managed by the Board, while the operating fund is 28% of the total. 80 During FY 1994 BOI charged the Consolidated Pension Fund $3,424,350 in management service fees which represents about 82% of the total charges. 81

TABLE 8

Actual BOI Expenses & BOI Management Fees

Fiscal Year	Actual Expenses	Service Fees Charged	Difference
1991	$2,267,274	$2,622,382	+ 355,108
1992	3,241,195	2,935,319	- 305,876
1993	3,324,393	3,355,009	+30,616
1994	3,472,492	4,187,516	+715,024
1995*	2,770,312	3,333,937	+ 563,625
Total	$15,075,666	$16,434,163	$ 1,358,497

** Expenses and Charges are through May 1995.*

Cause and Effect of the Overcharge

Current charges are based on net earnings which are volatile and have little relationship with the actual costs of investing. 82 Furthermore, a situation could occur where realized and unrealized losses could reduce net earnings to zero, which would mean no service fee could be charged. This was pointed out by an audit done by *Bear Stearns*. 83 Nevertheless, the Board is required by law to charge a fee in this manner. ?

Conclusion

Shown previously OK

Since over 80% of the total charge is assessed against the Consolidated Pension Fund, most of the overcharge is coming from pension funds. Consequently, pension funds and the Workers' Compensation fund are being diverted to the General Revenue Fund. **The PERD does not believe that this was the intention of the law, nor does it meet with fiduciary standards.** The statute does not allow for any overcharge to be transferred back to the Consolidated Pension Fund where they could be reinvested.

? What are the Fiduciary Responsib set in previous Findi

Furthermore, it is not clear that the actual costs of investing pension funds are proportional to total earnings or total assets. A more accurate approach to determining the actual investment costs should be used. Ideally, the service charge should be assessed based on the actual cost of services used by each fund. If this cannot be done, then costs should be at least based on asset size, not actual earnings. If the second option is chosen, the Board should develop a cost allocation plan which estimates the cost between the Consolidated Fund and the Consolidated Pension Fund. After this split is determined, the Board should allocate actual costs by asset size.

Sort of Redundant could be combined

are these Reccomendati ?

Recommendation 8

The Legislature should consider amending §12-6-6a to allow the Board of Investments to calculate the management service fee using an actual cost allocation formula. An alternative amendment would be to have the fee based on net assets. Net earnings are volatile and do not reflect the actual cost of investing the funds. The service fee should pay for the Board's actual expenses, not its appropriated budget.

Recommendation 9

If the Legislature decides to amend §12-6-6a to base the service fee on net assets, PERD recommends that the language allow the Board to transfer to the Consolidated Pension Fund and local governments, any excess service fees charged, rather than have any overcharge diverted to the General Revenue fund.

46. A8. Diana Will memo, page 2, item 1 which is her response to item 1 of my memo dated May 22, 1995.

47. A10. Steve Sears memo item 5. A12, Dennis Hesse memo, item 7.

48. K4. Page 395 (Positive Yield Curve), page 396 (Positive Yield Curve Graph).

49. D22. Money Market rates of return. Last two pages of D22. Also D24.

50. B4. - Rules for the Consolidated Fund Title 113, Series 1, Pages 4 and 5.

51. B4. - Rules for the Consolidated Fund Title 113, Series 1, Pages 4 and 5.

52. 100,000,000 * .05 = 5,000,000
100,000,000 * .051 = 5,100,000

Difference from 10 basis points 100,000

53. B7. Pages 816, 818, 820 point 25, 831.

54. B1. §12-6-1a

55. B1. §12-6-12

56. A2. Craig Slaughter memo, item 1, A3. Craig Slaughter memo, item 3, K1. "Legal Risks of Repurchase Agreements", last paragraph.

57. A3. Craig Slaughter, item 1.

58. I5. Page 37 K5. Pages 381, 426, 427 Overnight Repo, Repurchase Agreements.

59. A2. Craig Slaughter memo, item 1,

60. I5. Page 37.

61. A2. Item 1 of Craig Slaughter memo.

62. D14. Board minutes for March 22, 1995, page 3, last paragraph.

63. D16. Memo from Diana Will. D14 Board Minutes for March 22, 1995, pages 3 and 4.

64. D14. Board minutes for March 22, 1995, page 3.

65. K1.

66. K1. Page 2, last paragraph.

67. A2. Item 1 of Craig Slaughter memo. A10 Steve Sears memo item 1.

68. A10. item 1 of Steve Sears memo. Also A2, item 1 of Craig Slaughter memo.

69. A2. Item 1 of the Craig Slaughter memo.

70. J2.

71. I3. Pages 2-4, & I5 Page 38.

72. I3. Page 4,

73. I3. Page 4.

74. A10. Sears memo, item 1.

75. B1. §12-6-6a.

76. F5. Information from Steve Hughes, Budget Division of Legislative Auditor's Office. Compare Investment Service Fees collected by Board of Investments to fiscal year disbursements. The difference is shown in Table 8 of the report.

77. B4. Series 2, "Rules for the Administration of the Consolidated Pension Fund", item 6.2

78. D14. Board minutes for June 9, 1993, item number 8.

79. B1. §12-6-6(a)

80. D4. Pages 11, 41 Combined totals for the Consolidate Fund and the combined total for the Consolidated Pension Fund equals $4,223,150,000. Pension funds are 72% of the total (3,047,921/4,223,150=.72) and the Consolidated Fund is 28% of the total (1,175,229/4,223,150 = .278).

81. A2. Craig Slaughter memo, item 2. Also,
D26. Fiscal year 1994 equals the 3rd and 4th quarters of 1993 and the 1st and 2nd quarters of 1994. Add the services charges for the Cconsolidated Pension Fund ($678,457.57 (3rd quarter 93) + $998,241.47 (4th quarter 93) + $1,124,467.69 (1st quarter 94) + $623,183.55 (2nd quarter 94) = $3,424,350). This amount is 82% of the total charged $4,187,516 (see table 8 of the report).

82. A2. Craig Slaughter memo, item 2.

83. D1. P25, first paragraph.