Government Investment Behavior: Evidence from California Pooled Money

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Abstract. Local governments are playing an increasingly prominent role in the global investment area by holding large publicly-held pools of assets. The incentives for bureaucrats’ engagement in financial investment and their expertise are presumably distinctive from professional investors in the private markets. Therefore, it’s intriguing to study these government-held funds’ investment patterns and performance. To investigate these problems, this paper uses a hand-collected and novel data set that covers the transaction details of the California government pooled money investment account (PMIA) from 2014 to 2020. This paper presents a statistical analysis of the investments in the last 7 years and study the differences and similarities in behavior and performance between government investments and mutual funds. This paper also presents a model to measure the similarity of funds. I construct two relevant funds that require different levels of sophistication in selecting securities and activeness but are similar to the PMIA in other dimensions. Then I compare their performances with PMIA’s performance in the next period. This paper concluded that the government does perform worse and it is not because of their passive strategy but because of a lack of sophisticated skill. This paper provides new evidence of government investment behavior by rigorous statistical methods.

Keywords: Sovereign Wealth Funds, Mutual Funds, Investment Behavior.

1. Introduction

Large publicly-held pools of assets have become an important class of investments in terms of the size of assets under sovereign control. A large literature suggests that the growth of saving funds controlled by sovereign governments and their size may allow them to affect financial markets (see for instants [1,2]). [2] gives a complete overview of the development and outlook of Sovereign Wealth Funds (SWF). Previous estimation, most in 2007 and 2008, put the assets in the range of $2 to 3 trillion or even higher. Sovereign Wealth Fund Institute (SWFI) published “Top 100 Largest Sovereign Wealth Fund Rankings by Total Assets” at the end of 2020, and the amount is reported to exceed 8 trillion two largest funds, Norway Government Pension Fund Global and China Investment Corporation, are over 1.2 and 1 trillion respectively, accounting for about a quarter. The growth of SWFs may be viewed as a consequence of countries running persistent current account surpluses and accumulating net foreign assets. In sum, SWFs are major state-owned players of the 21st century, one typical example is the investment decisions managed by the government. Over the past few decades, local government investment pools have grown into a multi-billion dollars industry serving the investment needs of several thousand local governments in over forty states. The pooling arrangement provides local governments with the opportunity to benefit from economies of scale that lower administrative costs with the potential to earn higher yields than what they could earn investing on their own while preserving their political autonomy. Similar to a mutual fund, the government will also develop a certain investment strategy but may tend to change preference in a certain period because of some consideration of performing government functions, which is a typical difference compared to mutual funds. Our idea is to search for a national government or local government investment pool with detailed transaction data. [1] show that much discussion has been devoted to the need to be more transparent about the investment approach, by providing more information on the type and amounts of assets they hold, and about their governance structure, by clarifying how decisions are made and monitored. Few governments will disclose specific investment items and amounts. In this paper, I collect daily fund holdings data from California State Treasurer from Jan 2014 to Dec 2021: I examine are the government investment allocations and performance compared with a large number of funds in the economic market. This paper also obtains several characteristics about the mutual fund from the CRSP Mutual Fund...
database and use R, Stata for research. According to the California State Treasurer’s Office, through the Pooled Money Investment Account (PMIA), the State Treasurer invests taxpayers’ money to manage the State’s cash flow and strengthen the financial security of local governmental entities. PMIA policy sets as primary investment objectives safety, liquidity, and yield. The PMIA has three primary sources of funds: the State general fund; special funds held by State agencies; and money deposited by cities, counties, and other entities into the Local Agency Investment Fund (LAIF).

At first, this study focuses on some basic information about PMIA. It fell into two categories, the Treasury Bill (both notes and bills) and non-government bond, and gradually prefer to invest in Treasury Bill in recent years. Most investment items were centralized in risk-free or low-risk investments like Treasury Securities, while amount the non-government part mostly invested in big business and monetary assets, like investment banks. I calculate the average transaction yield per month by different terms to measure the risk premium and calculate the daily average yield and find out that it is consistent with the economic situation.

Autoregressive moving-average (ARMA) processes are widely used in time series analysis. [3] have derived the portmanteau test for such univariate time series models. [4] further extends the test to all multivariate autoregressive processes. The Ljung-Box test is known to be robust, and [5] reports on simulations that show just how robust it is to finite samples. This study will apply this goodness-of-fit test in our study to give some evidence about cyclical investment behavior across the California government. From a financial perspective, I pay attention to the management and performance of PMIA. All investment activities should share at least one objective: to make optimal decisions so that obtain as much return as possible. Managing public investment funds becomes best practice and new challenge for state and government (see [6]). At last, I discuss the effect led by economic shock, especially spending shock. This study figures out that there does exist some connections between the investment strategy and natural disasters happened in California. Specifically, we can often see seasonal variation in the term structure of PMIA, those particularly related to annual spending shocks.

2. Data and Overview of Pooled Money Investment Account

This section is to make a statistical analysis of the government’s investment behavior. While analyzing the fund pool through time series, there are many statistics worth paying attention to, portfolio diversity, fund size, cash flow, and yield. By analyzing the time series characteristics of these variables, we will have a systematic understanding of the government’s investment behavior. We can clearly see that the size of the fund pool is constantly expanding, which caters to the current development trend of sovereign wealth funds, and gives an overview of the changes in interest rates that cater to the current market situation, such as the Federal Reserve lowered its benchmark interest rate drastically since the COVID-19. This paper discusses the intrinsic correlation of the government’s investment in different periods in section 2.2.

2.1 Basic Information and Summary

![Fig. 1. Fund Size](image1.png)

![Fig. 2. The Proportion of Non-government bond](image2.png)

Figure 1 indicates that the size of the fund is growing. There are several reasons for the resulting growth of sovereign wealth funds. First, similar to a national fund and global growth trend, it can be viewed as a consequence of account surpluses like commodity-exporting. A second factor behind the growth of the fund is the execution of government functions. In some cases, these assets are used in many aspects as a financial stabilizer and providing welfare such as pension fund. Also, some state-specific characteristics link with the growth of the fund. California needs to face unpredictable spending shocks caused by natural disasters each year, those spending shocks have relatively larger effects on a state’s financial planning. Figure 2 shows how investment preferences changed over time. The vertical axis refers to the proportion of the total investment in non-government bonds, that is, excluding the Treasury Bill (both notes and bills) and pooled investment. It has a gradual downward trend, which indicates that the California government gradually prefers to invest in Treasuries. In other words, the investments were centralized in risk-free or low-risk, thus I pay attention to the transaction yield by time and different maturity terms.

By the type of transactions, I classify the transactions into two types: purchase and redemption. The transaction yield for newly purchases treasury bills carries different information from that of redeemed treasury bills. Yields of purchased assets reflect the most up-to-date dynamic yield for treasury bills and yields of redeemed is a measure the recent market-wide yield over a period. Figure 3 shows the average transaction yield per month.
for all items, purchases only, and redemptions only. Notice that the redemption case has hysteresis. It makes sense that the curve for yield of redemptions look like a parallel shift to the right of the curve for yield of purchases because there is little variation in the secondary market of treasury bills and the fund holds the treasury bills until redemption dates and takes no actions to respond to any market dynamics. Figure 4 shows the average transaction yield each day, the yield here refers to the interest rate of unexpired investment item in hand every day. The trend of yield is similar to the interest rate of the Treasury Bill from 2014 to 2020, the Federal Reserve increasing the benchmark interest rate rapidly from 2016 and decreasing drastically in the last two years.

Focused on purchase items, we could obtain the average transaction yield per month by different terms to measure the risk premium. For simplification, this paper thinks of a purchased item that lasts for less than 60 days as a 1-Month maturing investment. Similarly, last for between 60 days and 120 days think as 3-Month maturing, between 120 days and 240 days think as 6-Month maturing, between 240 days and 540 days (a year and a half) think as 1-Year maturing and ignore the items that days held longer than 540 days, which account for 6.54%. This paper shows the yield comparison graphs for the case of 1-Month, the remaining figures are placed in the appendix. These results show that the average yield is higher than Treasury Yield almost all the time, but some abnormal points appear opposite results, it is due to the above simplification that leads to lower abnormal fund average returns.

2.2 Whether the investment behavior is random: make inference through a statistical test

While these are all great modern tools for data analysis, the vast majority of asset modeling in the industry still makes use of statistical time series analysis. The data is a time series, a set of repeated observations of the same variable, such as the fund size. A trend can always be found in a time series, which will either be deterministic or stochastic. The former allows us to provide an underlying rationale for the trend, while the latter is a random feature of a series that we will be unlikely to explain. Trends often appear in financial series like stock market. In many fields of social science research, including finance, the development of random variables often exhibits very strong randomness. For instance, from figure 1, it seems that the growth of fund size is relatively stable. The Department of Applied Statistics develops time series analysis for solving the law of developmental changes in random series. This paper uses time domain analysis method to discuss the government investment behavior.

The time domain analysis method mainly reveals the development law of time series from the perspective of sequence autocorrelation, and has the advantages of solid theoretical foundation, standardized operation steps, and easy interpretation of analysis results. The development of events usually has a certain inertia, which in statistics is described as there is a certain correlation between sequence values, and this correlation has a certain statistical law. To explore whether the growth trend is stable, I focus on whether the cash flow is a stationary sequence. I present the transaction value per month in figure 7 and the time series chart shows that the transaction value of each month always fluctuates randomly around one billion to five billion, with no
obvious trend or cycle. To be more convincing, this paper also presents the autocorrelation plot in figure 8. The horizontal ordinate labeled lag in the graph represents the delay period denoted as k and the vertical ordinate represents the autocorrelation coefficient \( \rho_k \) (where \( k = 1, 2, ..., 84 \)). The coefficient \( \rho_k \) is a k-period delay multiplier, defined

\[
\hat{\rho}_k = \frac{\sum_{t=1}^{n-k} (X_t - \bar{X})(X_{t+k} - \bar{X})}{\sum_{t=1}^{n} (X_t - \bar{X})^2},
\]

where \( X_t \) (\( t = 1, 2, ..., 84 \)) is the observed time series (cash flow month), in here it refers to the transaction value. \( \bar{X} \) is the mean of \( X_t \). I will test whether it was a stationary sequence or white noise.

\[
H_0: \text{The sequence is independently distributed (i.e. the correlations in the population from which the sample is taken are 0 so that any observed correlations in the data result from the randomness of investment behavior).}
\]

\[
H_1: \text{The sequence is not independently distributed; they exhibit serial correlations.}
\]

The test statistic is defined as:

\[
Q = n(n + 2) \sum_{k=1}^{m} \frac{\hat{\rho}_k^2}{n - k}
\]

where \( n \) is the sample size, \( \hat{\rho}_k \) is the sample autocorrelation at lag k, and \( m \) is the number of lags being tested. Under \( H_0 \) the statistic Q asymptotically follows a \( \chi^2(m) \). For significance level \( \alpha \), the critical region for rejection of the hypothesis of randomness is

\[
Q > \chi^2_{1 - \alpha, m}
\]

where \( \chi^2_{1 - \alpha, m} \) is the \( (1 - \alpha) \)-quantile of the chi-squared distribution with \( m \) degrees of freedom.

Take \( \alpha = 0.05 \), the result varies with the choice of \( m \). In practice, the choice of \( m \) may affect the performance of the Q test statistic. Several values of \( m \) are often used, but taking a larger \( m \) will make the test insensitive. [5] shows that the test starts to deteriorate as the number of lags exceeds 5% of the length of the series whether or not the data are long-tailed. Provided that a stationary sequence shows a significant short-term correlation, then the sequence is not a white noise sequence so that we can analyze the correlation between the sequence values. If the number of delay periods considered is too long, it may overwhelm the short-term correlation of the sequence. As long as the delay period is long enough, the autocorrelation coefficient will converge to zero, so we will always have \( Q < \chi^2_{1 - \alpha, m} \) for \( m > N \), existing a positive integer \( N \). I calculate the p-value for \( m = 1 \) to 12. Furthermore, simulation studies (see section 2.2 in [7]) suggest that the choice of \( m \approx \ln n \) provides better power performance. In our analysis, \( m \approx 4.430816 \), that is, \( m = 4 \) or 5 and the test starts to be abnormal as \( m \geq 4.2 \) (5% of length 84). The Ljung–Box statistics give \( Q(4) = 7.2032 \) and \( Q(5) = 7.2049 \), which correspond to p-values of 0.2058 and 0.1588, respectively, based on chi-squared distributions with 4 and 5 degrees of freedom. The p-values of the two test statistics are all larger than 0.05, suggesting that the investment behavior is serially non-correlated. Not only for \( m = 4 \) and 5, as we can see from table 1, but the p-value is also significantly larger than the significance level \( \alpha = 0.05 \) for \( m = 3 \sim 11 \), we cannot reject the null hypothesis of a purely random process. From a rigorous point of view, can we conclude that there is no statistical law to follow for the fluctuation of the series, in other words, accept the white noise hypothesis? In statistical inference, it certainly does not mean that \( H_0 \) is true or that we even believe that it is true. All it means is, based upon the data at hand, that we are not convinced that the hypothesis \( H_0 \) is wrong, in another way, we do not reject \( H_0 \).
Another point that needs to be explained is, we may ignore
the seasonality in the series. Many time series contain
seasonal variation. This is particularly true in series
representing business sales or climate levels. In
quantitative finance we often see seasonal variation in
commodities, those particularly related to growing
seasons or annual temperature variation (such as natural
gas). [8] contrasts the investment behavior of different
financial institutions in debt securities as a response to
past returns and presents evidence that banks and
investment funds respond procyclically to past returns, i.e.,
there exists some kind of periodic within their investment
behavior. As mentioned above, when data are seasonal,
the autocorrelations will be larger for the seasonal lags (at
multiples of the seasonal frequency) than for other lags. If
very large autocorrelations are observed at lags spaced n
periods apart, in our analysis at lags 12, 24, 36, 48, and 60.
As we see \( \rho_{12}, \rho_{24}, \rho_{36}, \rho_{48}, \rho_{60} \) beyond
the confidence interval, then there is evidence of strong
periodicity. From another point of view, when \( m = 12 \),
the p-value is less than 0.0001, suggesting that transaction
values in the same month in every year are strongly
correlated. This result implies that a simple test is not
effective. The sequence may involve annual seasonality.
We need to try seasonal differencing at a selected period,
in this case, the seasonal period is 12, we should pay
attention to other lags in the analysis of seasonal time
series for which autocorrelations with lags at multiples of
the seasonality are more important. The investment
behavior may imply annual relevance.

### Table 1. Q test statistics and p-values for \( m = 1 \) to 12

<table>
<thead>
<tr>
<th>( m )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Q )</td>
<td>5.229</td>
<td>6.391</td>
<td>6.588</td>
<td>7.20</td>
<td>7.20</td>
<td>9.27</td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.022</td>
<td>0.040</td>
<td>0.086</td>
<td>0.12</td>
<td>0.20</td>
<td>0.15</td>
</tr>
</tbody>
</table>

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### 3. Comparative Financial Performance

In this part, I am going to discuss the financial
performance of the fund managed by the California State
Government. This paper develops a method to comparing
investment strategies that meet the same demand for
liquidity. With this comparison, we can evaluate the
performance of the fund managed by government
agencies against other financial institutional investors.
As we can imagine, governments are special financial
investors when compared to other professional investors
at least in two ways. First, governments’ rationale or
constraints when making an investment decision is
different from professional investors. Governments’ goal
is to maintain sufficient liquidity for the operation and
management of the public sector in the local economy, so
they are faced with demand shocks for public services
and/or goods. As opposed to that, professional investors
such as mutual fund managers are aiming at maximizing
their customers’ utility. Governments are likely much
more risk-averse than average investors. Second, in terms
of capacity to manage an investment fund, governments’
professionals are different from fund managers in the
private sector. Fund managers are more experienced in
managing financial investment than government
bureaucrats. In addition to better skills, fund managers
might perform better than government officials as they are
less likely to be distorted by other non-pecuniary
incentives (political incentives or individual career
concerns). However, there are still chances that
government officials as investors can outperform fund
managers in areas that they have private information.
Especially if the invested financial securities are issued by
government agencies, such as treasury bills or municipal
bonds, government officials have an advantage over
managers in the private financial sector. In conclusion,
it remains an empirical question which force as discussed
above dominates the other. This makes the comparison
between government-managed funds and professionals-
managed funds an intriguing exercise.

The California State Government’s Investment Fund Pool
is highlighted by two features: (1) short-term; (2) holding
to maturity. These make the Investment Fund Pool a
relatively “passive” investment strategy. The potential
active ness of its strategy only lies in: (1) how much
additional fund to invest in each month; (2) when adding
new fund, which securities to choose. This limits the Fund
to reap profits when the bond is overpriced in good market
conditions before the maturity date. In addition, it’s
unlikely that government can time the market: they can
only reduce the fund size in bad times but can’t increase
fund size in good times as the money comes from a fiscal
budget which is mostly pre-fixed. These features make the
Investment Fund Pool managed by California State
Government less active than it can if it was managed by a
professional fund manager.

Our approach to evaluating the performance of the fund is
divided into two steps. First, based on the term to maturity
and coupon rate adjusted by default rate, this paper selects
for each security in the Investment Fund Pool a
comparable security from the universe of all fixed-income
securities invested by bond mutual fund managers.
Essentially, this paper is seeking securities that can
generate similar cash flow to ensure “comparability”. The
expected cash flow for a bond in each period is:

\[
C(1 - p)^t
\]

where \( C \) is the coupon, and \( p \) is the periodic probability of
default. The default probability can be implied by its
pricing:

\[
Price = \sum_{t=1}^{T} \frac{C(1 - p)^t}{(1 + y)^t} + \frac{F(1 - p)^T}{(1 + y)^T}
\]

where \( F \) is the principal of the bond, and \( y \) is the yield-to-
maturity (YTM) of the bond.
From the equation above, to claim that two bonds are identical they should be similar in three measures: (1) coupon rate (2) maturity date (3) price (yield to maturity). Based on these criteria, this paper finds for each fixed-income security in the Investment Fund Pool one or a set of similar bonds from the universe of bonds invested by mutual fund managers. Figure 9 plots the distribution of coupon rate and term to maturity of all securities invested. To make the matching feasible, I digitize these two measures: coupon rate at 1‰ level (for example, if the coupon rate is 0.26%, I approximate it by 0.3%) and term to maturity by months.

Therefore, I can replicate the cash flow generated by the Investment Fund Pool using bonds from the Mutual Fund universe. To be more specific, in each month, I use the same amount of money and same allocation across bonds with various terms and coupon rates but using bonds from the Mutual Fund universe. Then in the following months, I trade this sub-portfolio in the same way as the aggregate mutual fund. For example, if in one month according to the strategy, I buy $1 Million bond A and all the mutual fund managers hold a total of $1 Billion bond A; and the next month, the total amount of bond A held by all the mutual fund managers is reduced to $0.9 Billion, proportional to that, I will sell $0.1 Million Bond A. Figure 10 shows the cash flow generated by such mimicking portfolio. I call this strategy a “Micking MF” strategy as it mimicks the aggregate fund volumes of PMIA fund, but uses different set of assets. It is a counterfactual of the PMIA’s investment strategy. In the counterfactual world, the manager of PMIA fund has the same amount of money to invest in financial securities in each time point but he or she choose to replicate the selection of securities and weighting made by a representative investor in the mutual fund sector. Practically, this is not difficult to conduct as the overall mutual fund investment in treasury bills are observable and easy to track. To some extent, this “Mimicking MF” strategy is not very active. It is only active up to the degree of the overall mutual fund industry. But it exploits the financial expertise of fund managers in the mutual fund industry: the selection of different maturities in each time point, and the weights put on each category of assets. Any performance gap between the PMIA and this “Mimicking MF” strategy can be attributed to the lack of financial sophistication.

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In addition to the lack of financial expertise, another concern that this paper has for PMIA’s style in managing the fund is the passiveness. As this paper has shown and discussed earlier, it almost holds all the securities until the maturity data and almost never traded in the secondary market. To address this concern, I construct another strategy that is to hold the treasury bills only for 3 months instead of until the maturity date as PMIA fund manager does. Each time when I re-construct the portfolio, I replicate the allocation of funds across different assets as what PMIA does in its set of newly “purchases” assets. I call this “Quarterly Rebalance” strategy. This is a much more active strategy, but compared to the “Mimicking MF” strategy, it involves much less skill. Therefore, any gap between “Quarterly Rebalance” strategy and PMIA strategy should a result from lack of “activeness”. With these comparisons, I can better evaluate the performance of the government-managed Investment Fund Pool. Results are illustrated in Figure 11. It plots the cumulative return for each strategy. That is if I normalized the fund size in 2014M2 into $1, what is the value of the fund in the subsequent years. The figure demonstrates the underperformance of the Investment Fund Pool relative to a “Mimicking Mutual Fund” strategy. However, it still outperforms an active but simple “Quarterly Rebalance” strategy. These results indicate that government officials do perform worse than professional managers. And the reason is not simply because of “passiveness”, but also lack of sophisticated skill.

4. Discussions on the Mechanism

This paper has concluded so far that PMIA may underperform because of a lack of financial skill in the
selection of financial securities and the correct weights assigned to each asset. In this section, I attempt to provide some possible explanations on the causes of such lack of financial sophistication.

I will discuss the impacts of natural disasters and pandemics on the investment behaviors and performance of government-held fund. In general, we believe that the inadequacy in selecting financial securities in a proper way is due to psychological shock from natural disaster and pandemic events. As the major purpose for bureaucrats to make financial investment is to guarantee enough funds for public expenditure within its authority, a shock like COVID-19 may change their expectations of future surges in public health expenditures and therefore impede them from investing professionally. On the one hand, the budgeted amount for investment is lower after such shock events due to risk aversion and precautionary savings. On the other hand, the fund manager is prohibited to continue the predetermined investment strategy.

As this paper has mentioned before that the government will adopt a certain investment strategy balancing the target of achieving more return and the responsibility of performing government functions. This section will reveal some connections between the interest rate term structure and the natural disaster happened in California, which represents changes in the government’s risk appetite when facing economic shocks.

Labels x-Month ($x = 1, 3, 6, 12$) in figure 12 and 13 refer to different terms of investment items, which is consistent with section 2.1. These graphs show the changes in the proportion of investment items with different interest rates held in a certain period of time, that is, changes in the term structure of interest rates in seven years and each year. The term structure graphs from 2015 to 2020 is in the appendix II. The stock of short-term bonds held by the government is small and has remained almost stable within the 7 years. However, figure 12 shows that the changes for medium and long-term bonds exhibits regular fluctuations, the long-term bonds decrease first and then increase in the interval of each year while the medium one performs oppositely.

At the beginning of each year, especially in winter California suffers from many serious natural disasters, such as drought, winter storm and flood. Significant changes in the term structure of interest rates due to the impact of increased financial pressures led by spending shock. When it comes to middle of the year, the California government began to gradually increase the proportion of long-term bond holdings, and gradually returned to the level at the beginning of the year. Even so, it can be clearly seen from figure 12 that the annual average holding ratio of long-term bonds has shown a slow decline year by year, which seems to correspond to the aforementioned that the investments gradually prefer Treasuries, that is, the investment strategy turn out to be lower risk by degrees.

CA government counts the Disaster List on their website Some are even measured as the worst one in the past decades. As for 2014-2020, this paper retrieves the following events from News and Climate.gov:

- Jan 2014 Drought. Study: California drought is the most severe in at least 1,200 years
- Dec 2014 Winter storm. Hurricane-Force Winds, Torrential Rain Forecast For What Could Be Storm Of The Decade
- Jan 2016 Rainstorms. Rains return to California to start 2016
- Jan 2017 Floods. Northern California gets its wettest winter in nearly a century
- Jan 2018 Winter storm. Mudslides to California in January 2018
- Jan 2019 Winter storm
- Some strange performance appeared in the figure can be explained by the severity of the disaster that year. In 2014, the increase was mainly short-term bonds, which implies that the government might encounter a heavier financial burden than usual. The California 2014 drought was the worst the state has seen in at least 1,200 years, according to a study at the time published by the American Geophysical Union. In 2020, the increase in medium-term bonds even makes its holdings the highest in a period of time. One reason is to provide funds for emergency expenditures to fight the COVID-19 epidemic. At the same time, the number of confirmed diagnoses in California has increased sharply from July 2020, which has further increased the financial pressure. It is necessary for the government to adopt a multi-pronged cash management strategy to ensure sufficient government liquidity in order to fulfill its payment obligations. We can often see seasonal variation in term structure, those

![Changes in the term structure of interest rates](image1)

**Fig. 12. Term Structure in seven years**
particularly related to annual spending shocks (such as natural disasters). There exists some kind of periodic within their investment strategy.

Conclusion

In this paper, I focus on the investment patterns and performance of a novel fund that is managed by California State government – PMIA. I hypothesize that the fund will be managed in a unique style. This paper presents facts and statistical analysis on the patterns of the fund flow, transaction frequencies, and yields on various dimensions. Overall, the management style of PMIA is featured by simplicity, seasonality and passiveness. Then I try to evaluate the performance of PMIA. The underperformance (or overperformance) can be attributed to two factors: (1) financial expertise of fund manager; and/or (2) passiveness. This paper constructs two benchmark funds for such evaluation – “Mimicking MF” that replicates the financial skills of mutual fund industry and “Quarterly Rebalance” which takes an extremely active management style. By examining the performances of the three funds over long horizon, this paper concludes that PMIA may underperform due to lack of financial sophistication but the “passiveness” does not contribute to this. This paper also attempted to discuss the potential mechanism for this lack of financial skills from the perspectives of natural disasters and pandemics.

Overall, this paper provides some novel and micro evidence on the uniqueness of government’s style in managing investment fund. This is not surprising as bureaucrat have different incentives when they make financial investments in comparison to professional managers in the private sector. Following this paper, it will contribute to our understanding of government’s role in financial market by more investigation into its special incentives in financial investment and the consequences.

Appendix

I. The Average Transaction Yield and Difference in other terms, 3-Month, 6-Month, and 12-Month

Fig. 14. Transaction Yield (3-Month)

Fig. 15. Difference of Transaction Yield (3-Month)

Fig. 16. Transaction Yield (6-Month)

Fig. 17. Difference of Transaction Yield (6-Month)

Fig. 18. Transaction Yield (12-Month)

Fig. 19. Difference of Transaction Yield (12-Month)

II. The Term Structure from 2015 to 2020

Fig. 20. Term Structure in 2015

Fig. 21. Term Structure in 2016
Fig. 22. Term Structure in 2017

Fig. 23. Term Structure in 2018

Fig. 24. Term Structure in 2019

Fig. 25. Term Structure in 2020

References


