Treasury Analysis and Liquidity Status Report

Prepared for: Finance and Administration Committee - Period ending December 31, 2017

CalPERS

Public Employees' Retirement Fund (PERF)

The PERF provides retirement benefits to the State of California, schools and other California public agency employees. The PERF benefits are funded by member contributions, employer contributions, and by investment earnings. Changes in investment asset allocation and investment strategies can significantly impact data reported from period to period.

Liquidity Coverage Ratio Analysis

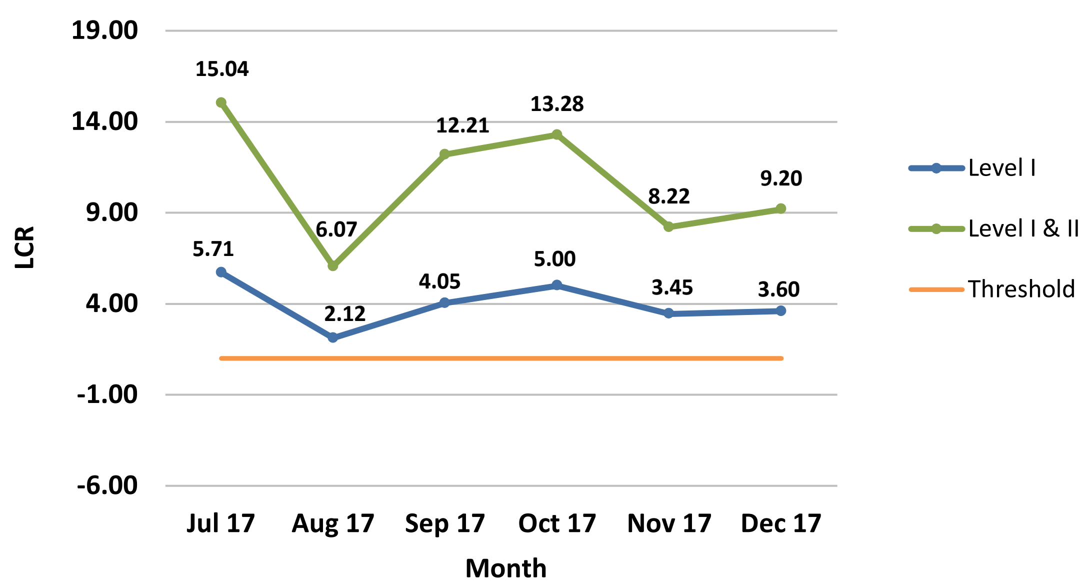
$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

Funding Sources and Graph Details

Level I: Cash & Cash equivalents (assets maturing less than 30-days)
Level II: Cash equivalents maturing greater than 30-days + borrowed liquidity held in cash
Level III: Sale of public assets
Threshold: Indicates the Fund's ability to cover 100% of monthly obligations.

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.

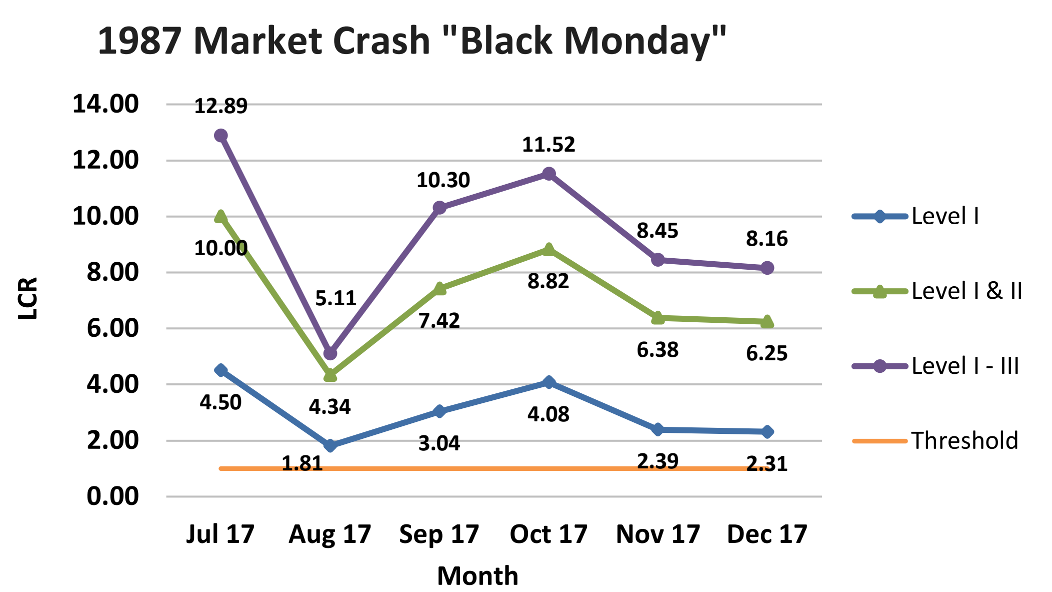


Level I: Level I LCR exceeded the threshold in July through December. August's LCR decreased due to a $3.26B transition from Liquidity; $2B to Global Equity and $1.26B to Global Fixed Income. September's LCR increased due to a decrease in private investment uses. October's LCR increased due to the additional $2B from State contributions. November's LCR decreased due to the October's additional State contributions being invested.

Level I & II: Since Level I LCR remained above the threshold, it was not necessary to utilize Level II assets in July through December. December's LCR increased due to an increase in securities lending activity.

Stressed Environments - 30-Day Liquidity Coverage Ratios

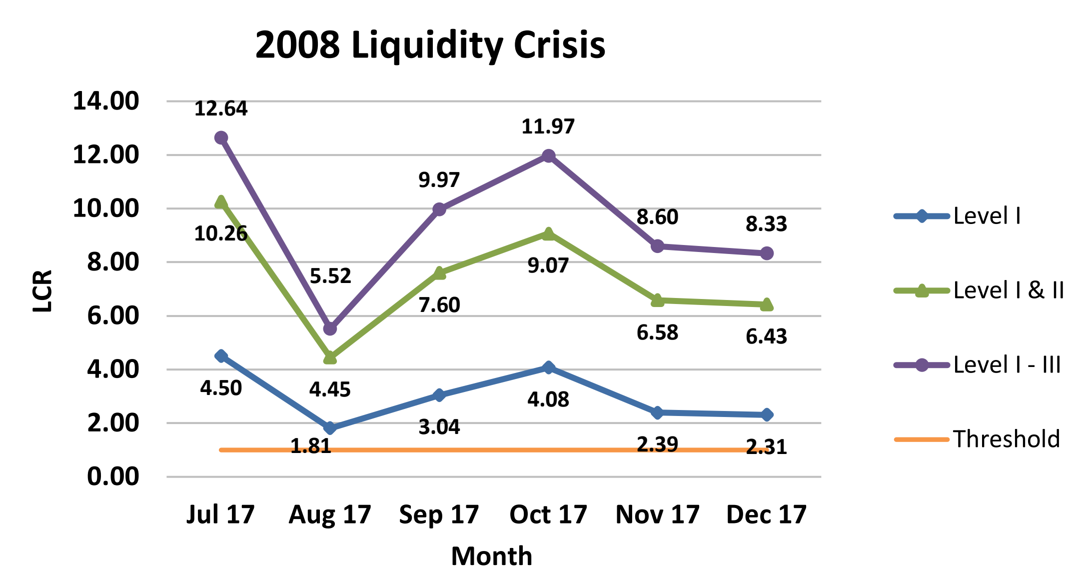
Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Under the stressed scenarios, asset class sources were reduced to zero and uses were doubled.



Level I: Level I LCRs were adequate had a stressed event similar to "Black Monday" occurred. August's LCR decreased due to a $3.26B transition from Liquidity; $2B to Global Equity and $1.26B to Global Fixed Income. October's LCR increased due to the additional $2B from State contributions. November's LCR decreased due to the October's additional State contributions being invested.

Level I & II: CalPERS would not have needed to utilize Level II assets.

Level I – III: CalPERS would not have needed to utilize Level III assets.



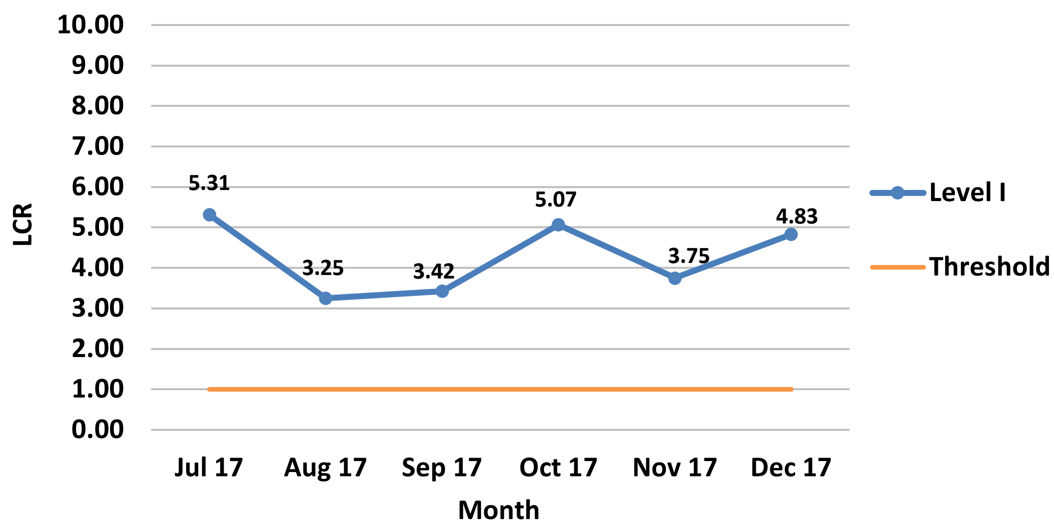
Level I: Level I LCRs were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. August's LCR decreased due to a $3.26B transition from Liquidity; $2B to Global Equity and $1.26B to Global Fixed Income. October's LCR increased due to the additional $2B from State contributions. November's LCR decreased due to the October's additional State contributions being invested.

Level I & II: CalPERS would not have needed to utilize Level II assets.

Level I – III: CalPERS would not have needed to utilize Level III assets.

Crisis Environment - 10-Day Liquidity Coverage Ratio

The 10-day LCR utilized only the available cash balance ten days prior to the payment date. In a crisis environment, CalPERS would not have access to Level II and Level III assets. The calculation assumed a five business day market lockdown as experienced on September 11th, 2001.



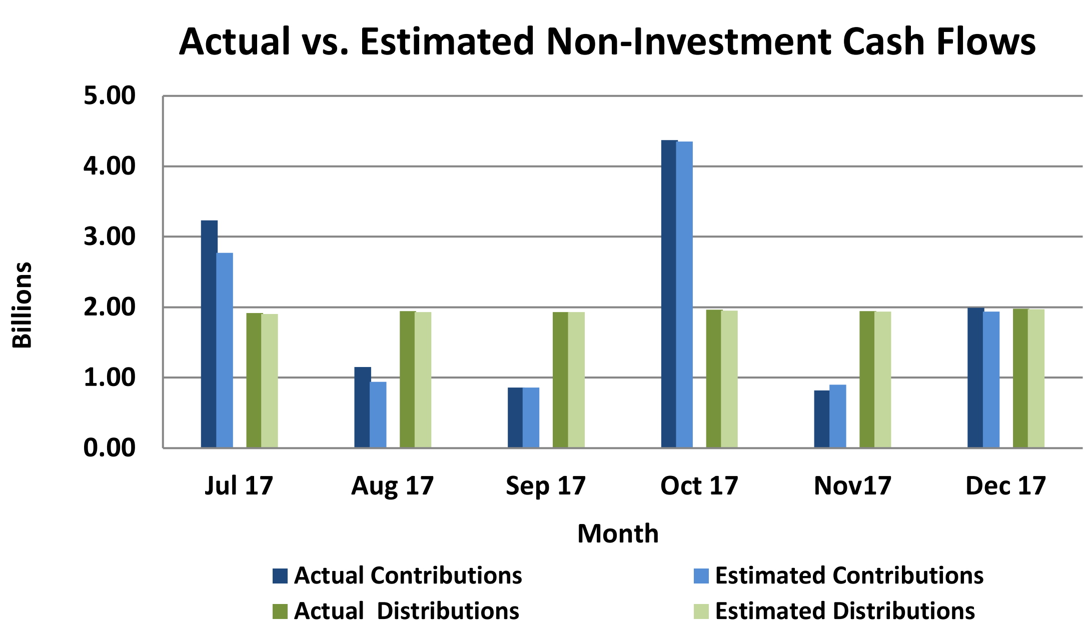
Level I: August's LCR decreased due to an increase in private investment uses. October's LCR increase was due to additional State contributions. The PERF had sufficient cash to cover obligations ten days prior to the funding of member benefits in July through December. This indicated Level I was adequate had a crisis event occurred.

Overall PERF Liquidity Health

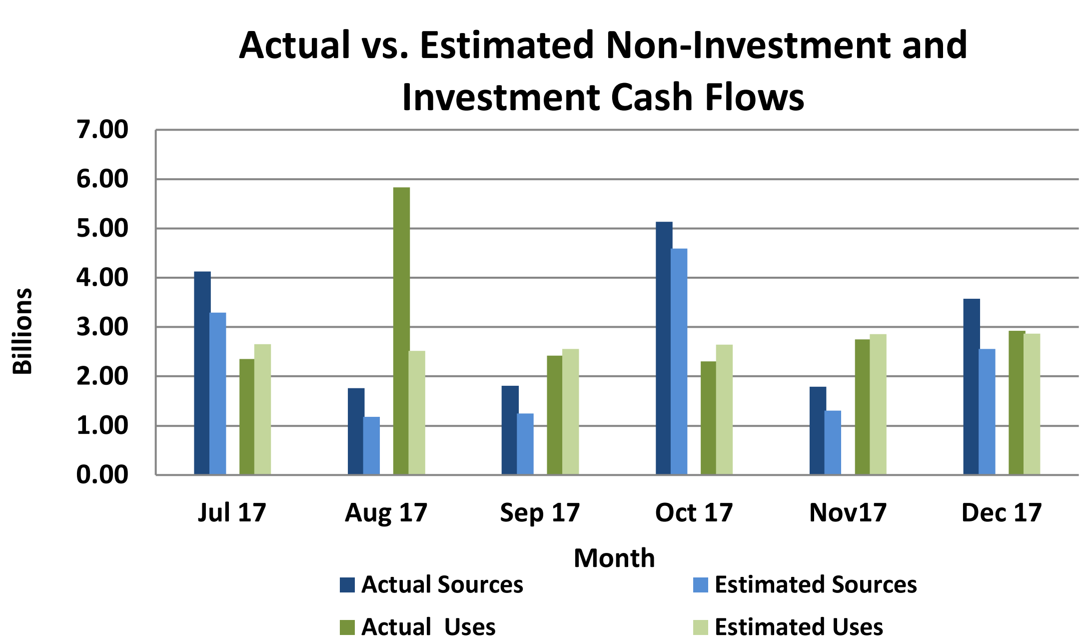
Coverage Ratio Analysis:

- ✓ CalPERS was able to make payments for benefits, operating expenses and projected investments regardless of market conditions.
- ✓ PERF's liquidity remained above the threshold in the normal environment and was adequate in stressed and crisis environments.

PERF Cash Flow Forecasting



With the exception of July and August contributions, cash flow forecasting accuracy was in the 90th percentile. July and August contribution variances were due to higher than expected unfunded accrued liability payments. These lump sum payments towards unfunded accrued liabilities were at the employers' discretion. The increase in October's contribution was due to the additional $2 billion from State contributions.



Cash flow forecasting for total fund cash activities (both non-investment and investment) can be volatile. Components that drove forecast volatility included, but were not limited to: private equity activity, real estate and investment expenses. August distribution variance was due to the allocation shift from Liquidity to Global Equity and Global Fixed Income. The increase in October's contribution was due to the additional $2 billion from State contributions.

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CalPERS

Legislators' Retirement Fund (LRF)

The LRF provides retirement benefits to California Legislators elected to office before November 7, 1990, and to constitutional, legislative, and statutory officers elected or appointed prior to January 1, 2013. The Fund is closed to new participants. The number of LRF members has been declining in the last decade as eligible incumbent Legislators leave office and are replaced by those ineligible to participate in the LRF. Actuarially determined contributions will continue to be made by the State of California to supplement the existing assets until all benefit obligations have been fulfilled. The Fund maintains a cash equivalent reserve equal to two months of member benefit payments and obligations.

Liquidity Coverage Ratio Analysis

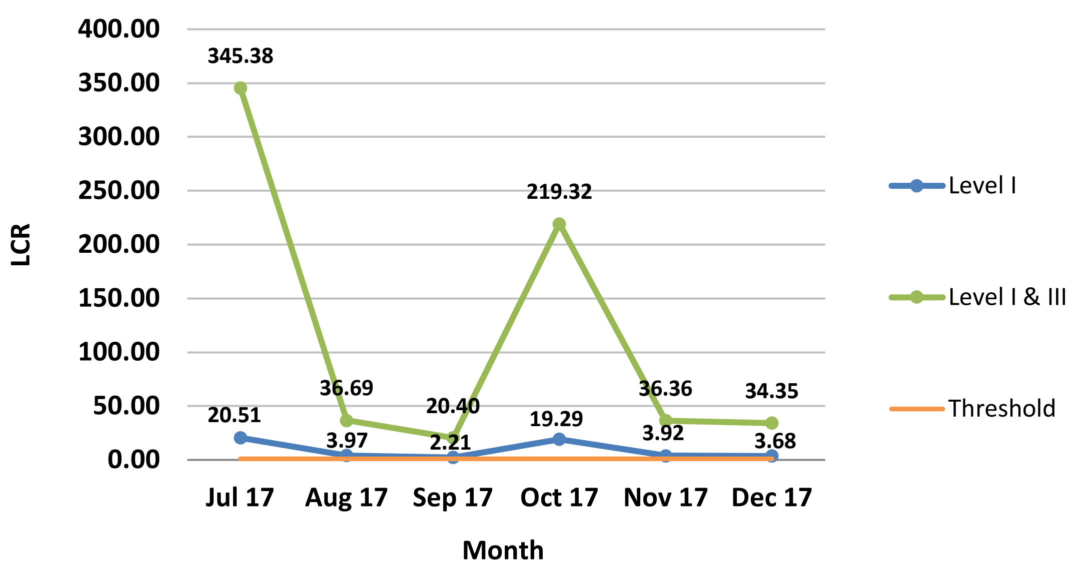
$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

Funding Sources and Graph Details

Level I: Cash and cash equivalents + Reserves
Level III: Sale of public assets
Threshold: Indicates the Fund's ability to cover 100% of monthly obligations

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.



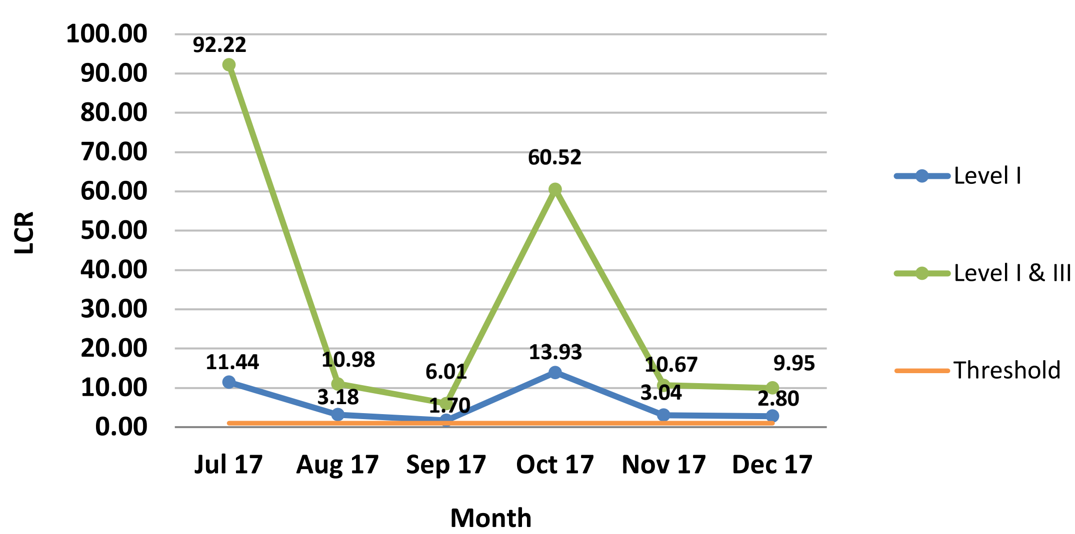
Level I: Level I LCR remained above the threshold in July through December. July's LCR increase due to the timing of member benefit payments, which was paid in August. October's LCR increased due to the timing of benefit payments.

Level I & III: Since Level I LCR remained above the threshold, it was not necessary to utilize Level III assets. August's significant decrease was due to the timing of benefit and tax payments.

Stressed Environments - 30-Day Liquidity Coverage Ratios

Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Under the stressed scenarios, asset class sources were reduced to zero.

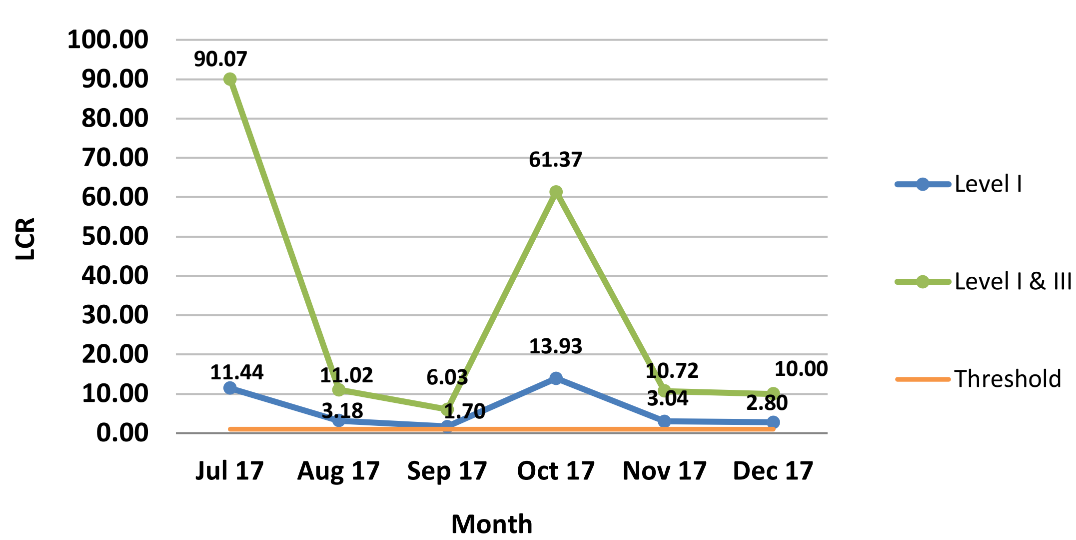
1987 Market Crash "Black Monday"



Level I: Level I assets would have been adequate had a stressed event similar to "Black Monday" occurred. July's LCR increase due to the timing of member benefit payments, which was paid in August. October's LCR increased due to the timing of benefit payments.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to "Black Monday" occurred. August's significant decrease was due to the timing of benefit and tax payments.

2008 Liquidity Crisis

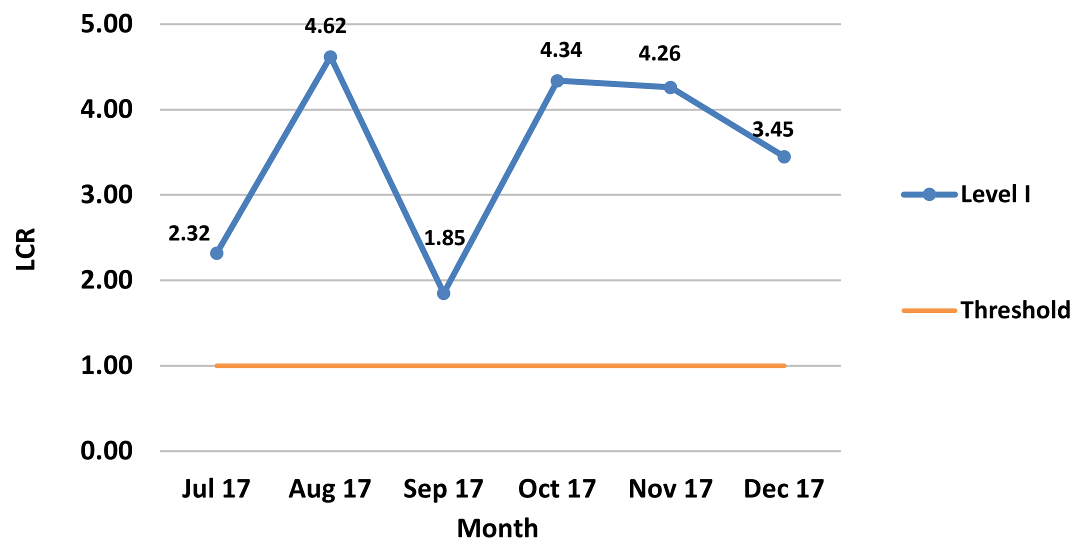


Level I: Level I assets would have been adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. July's LCR increase due to the timing of member benefit payments, which was paid in August. October's LCR increased due to the timing of benefit payments.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. August's significant decrease was due to the timing of benefit and tax payments.

Crisis Environment - 10-Day Liquidity Coverage Ratios

The 10-day LCR utilized only the available cash balance ten days prior to the payment date. In a crisis environment, CalPERS would not have access to Level III assets. The calculation assumed a five business day market lockdown as experienced on September 11th, 2001.



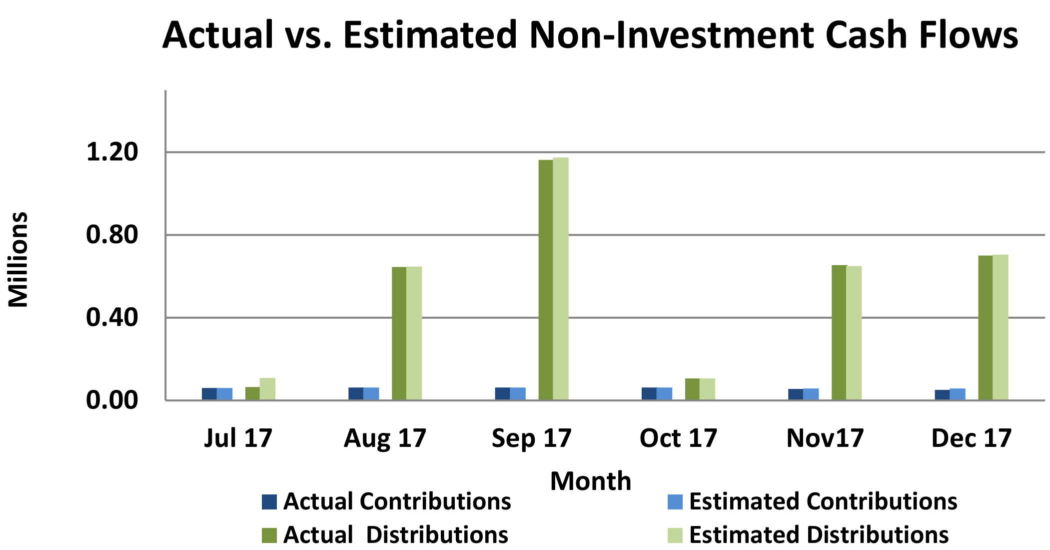
Level I: The LRF had sufficient cash to cover obligations ten days prior to the payment date. This indicated Level I would have been adequate had a crisis event occurred.

Overall LRF Liquidity Health

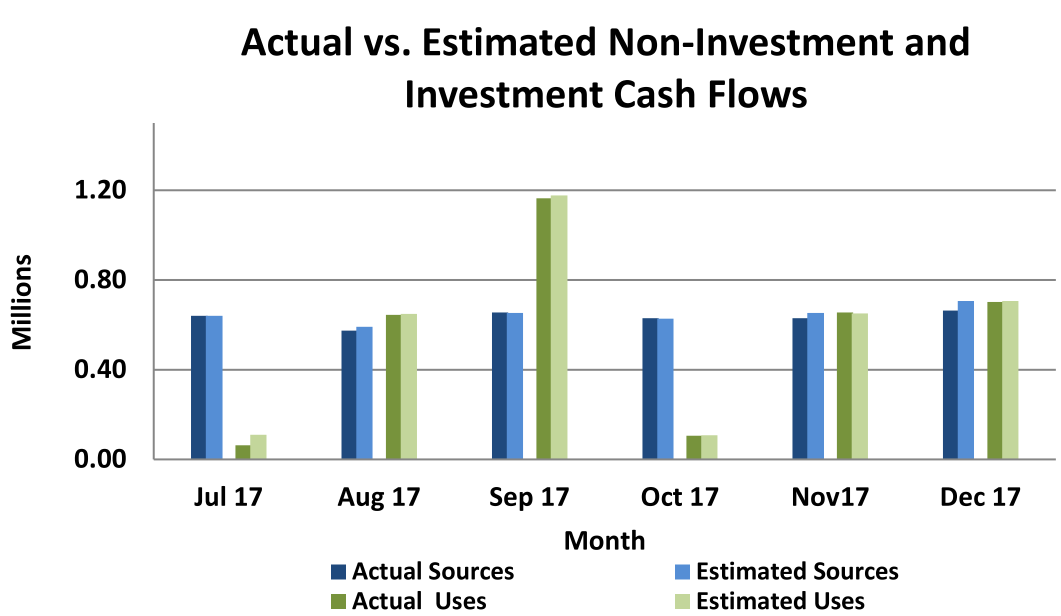
Coverage Ratio Analysis:

- ✓ LRF was able to make payments for benefits and operating expenses regardless of market conditions.
- ✓ LRF's liquidity remained above the threshold regardless of market conditions.

LRF Cash Flow Forecasting



Cash flow forecasting accuracy was in the 90th percentile.



Cash flow forecasting accuracy was in the 90th percentile.

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Judges' Retirement Fund I (JRF I)

The JRF I provides retirement benefits to California Supreme and Appellate Court Justices and Superior Court Judges appointed or elected before November 9, 1994. The State of California does not pre-fund the benefits for this fund. The benefits are funded on a pay-as-you-go basis. The Fund maintains a cash equivalent reserve equal to two months of member benefit payments and obligations.

Liquidity Coverage Ratio Analysis

$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

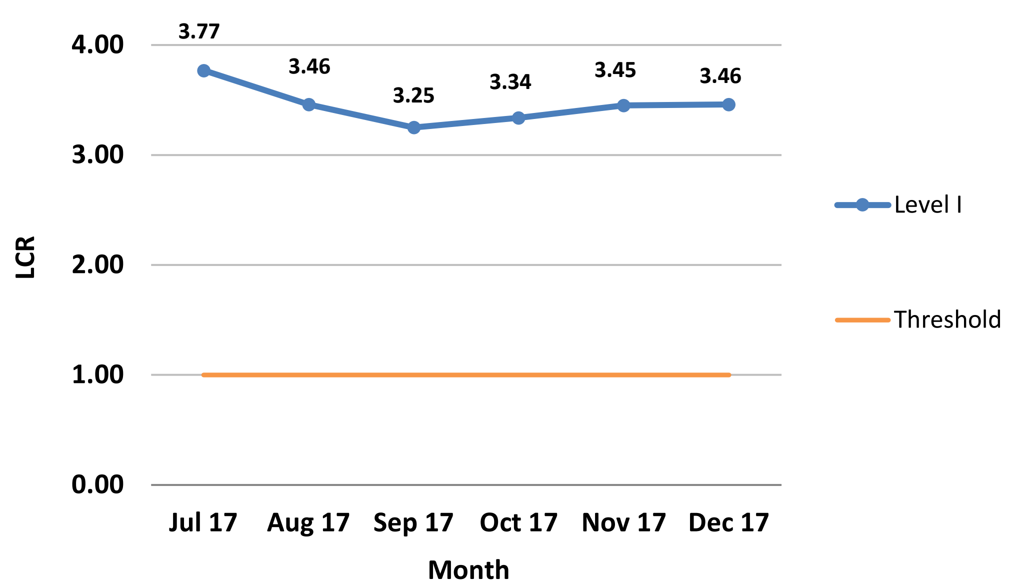
Funding Sources and Graph Details

Level I: Cash and cash equivalents + Reserves

Threshold: Indicates the Fund's ability to cover 100% of monthly obligations

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.

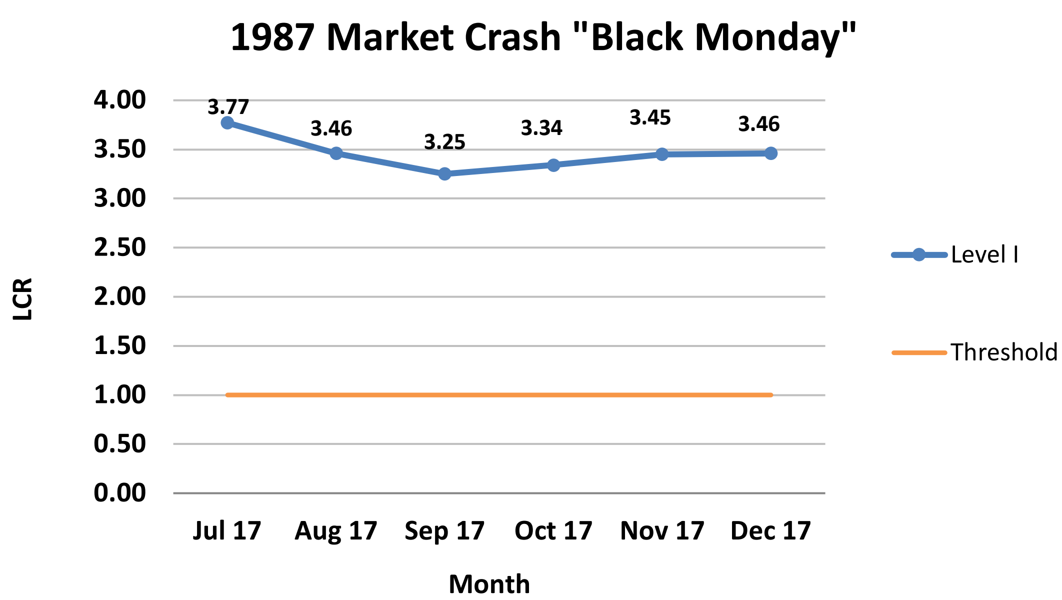


Level I: Level I LCRs remained above the threshold. The Fund maintained adequate inflows to cover monthly liabilities.

Reserves: Since Level I LCRs remained above the threshold, it was not necessary to utilize Reserves.

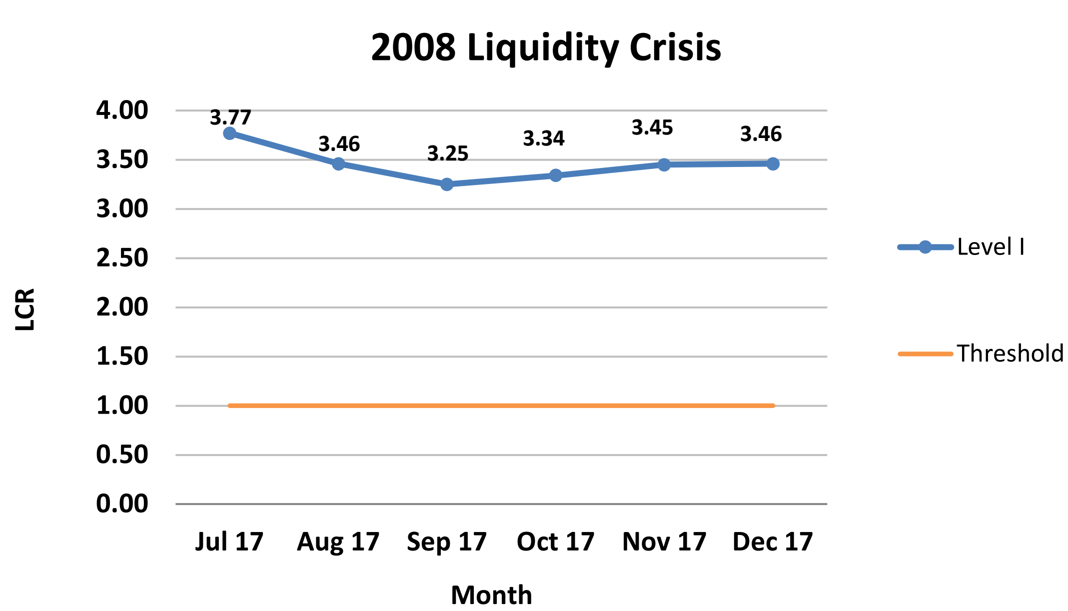
Stressed Environments - 30-Day Liquidity Coverage Ratios

Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Since 100% of Reserves for JRS I were held in cash and cash equivalents, stress factors did not apply and the LCRs remained the same as the normal environment.



Level I: Level I LCRs were adequate had a stressed event similar to "Black Monday" occurred.

Reserves: Level I assets and Reserves were adequate had a stressed event similar to "Black Monday" occurred.



Level I: Level I LCRs were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred.

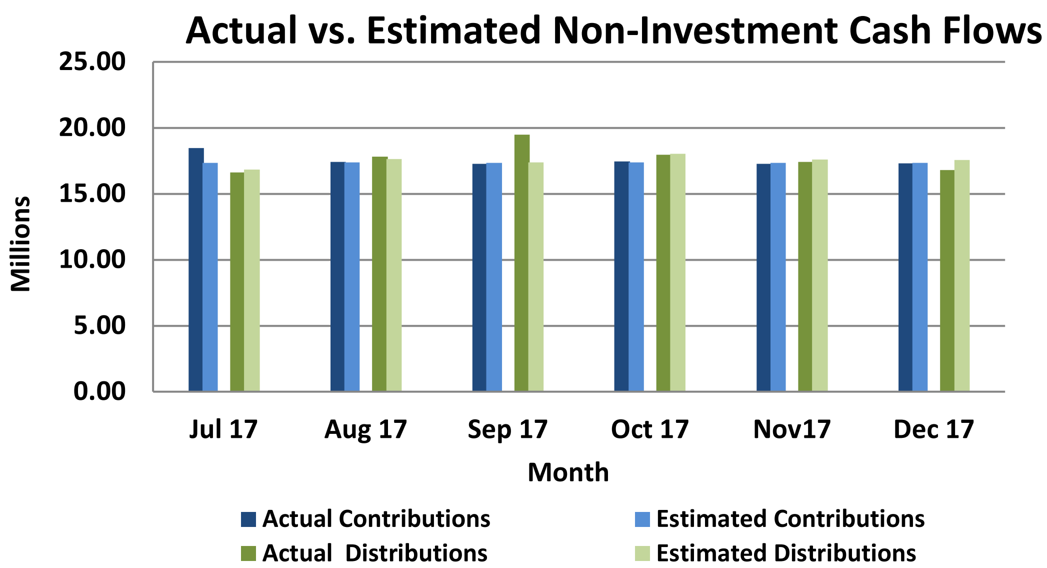
Reserves: Level I and Reserves were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred.

Overall JRF I Liquidity Health

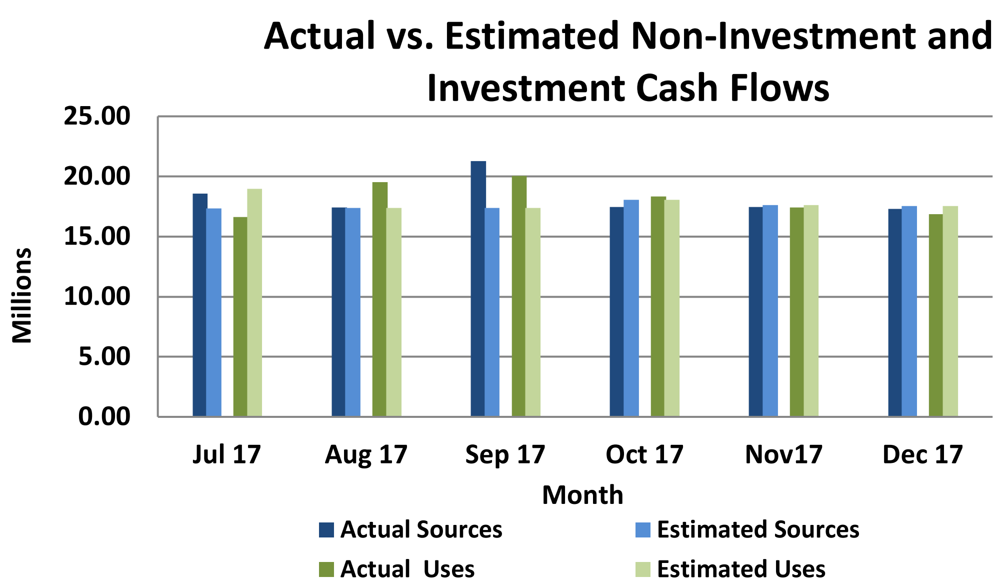
Based Coverage Ratio Analysis:

- ✓ JRF I was able to make payments for benefits and operating expenses regardless of market conditions.
- ✓ JRF I's liquidity remained above the threshold in the normal environment and was adequate in both stressed environments.

JRF I Cash Flow Forecasting



With the exception of September, cash flow forecasting accuracy was in the 90th percentile. September's distribution variance was due to a lump sum retroactive back pay.



Sources and uses variances are due to the timing of monthly cash transfers. September's distribution variance was due to a lump sum retroactive back pay.

Treasury Analysis and Liquidity Status Report

Prepared for: Finance and Administration Committee - Period ending December 31, 2017

Judges' Retirement Fund II (JRF II)

The JRF II provides retirement benefits to California Supreme and Appellate Court Justices and Superior Court Judges first appointed or elected on or after November 9, 1994. This system provides a unique combination of two basic types of retirement benefits: a defined benefit plan and a monetary credit plan. The benefit payment is comprised of member contributions and a portion of employer contributions, plus interest. Monetary credits are incentives for judges to stay in their current position and are lump-sum payments.

Liquidity Coverage Ratio Analysis

$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

Funding Sources

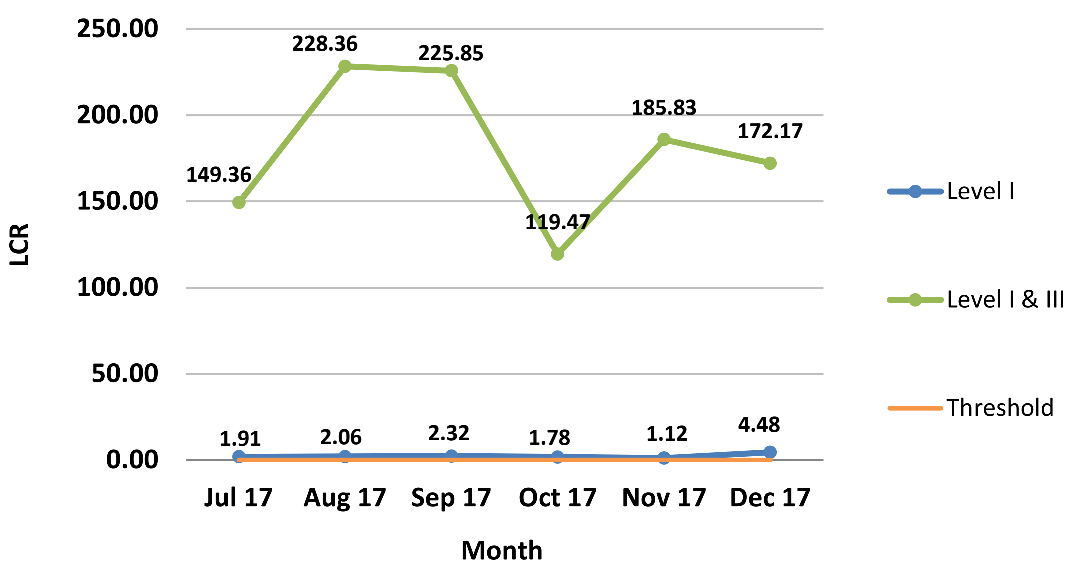
Level I: Cash and cash equivalents

Level III: Sale of public assets

Threshold: Indicates the Fund's ability to cover 100% of monthly obligations

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.



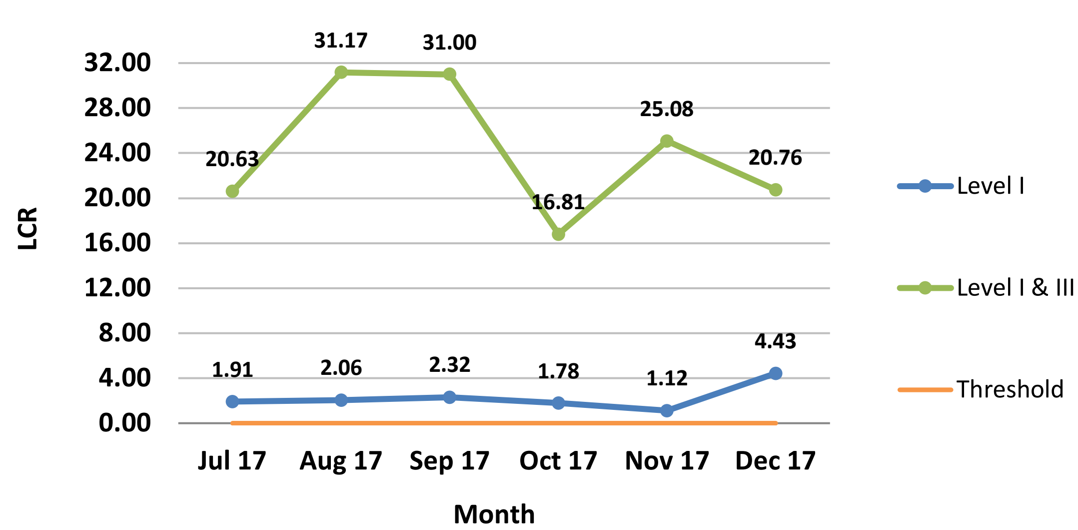
Level I: Level I LCRs remained above the threshold in July through December. The increase in December was due to the timing of the cash transfer.

Level I & III: Since Level I LCRs remained above the threshold, it was not necessary to utilize Level III assets. July and October's LCR decrease was due to monetary credit payments. Fluctuations in Level III assets are typically due to monetary credit payments which can double the outflows for the month.

Stressed Environments - 30-Day Liquidity Coverage Ratios

Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Under the stressed scenarios, asset class sources were reduced to zero.

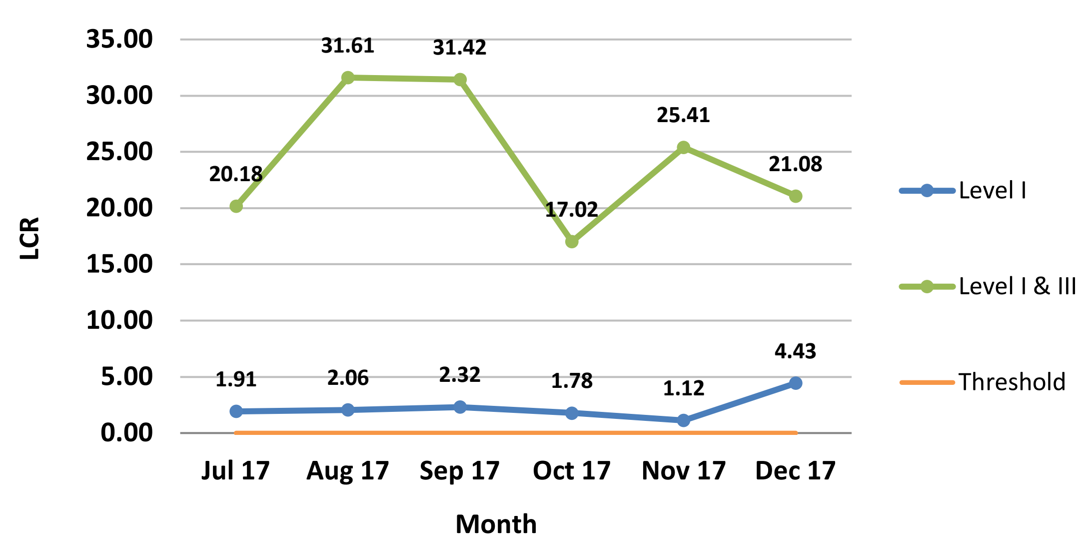
1987 Market Crash "Black Monday"



Level I: Level I LCRs were adequate had a stressed event similar to "Black Monday" occurred. The increase in December was due to the timing of the cash transfer.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to "Black Monday" occurred. July and October's LCR decrease was due to monetary credit payments. LCR fluctuations were due to monetary credit payments, which vary month to month.

2008 Liquidity Crisis

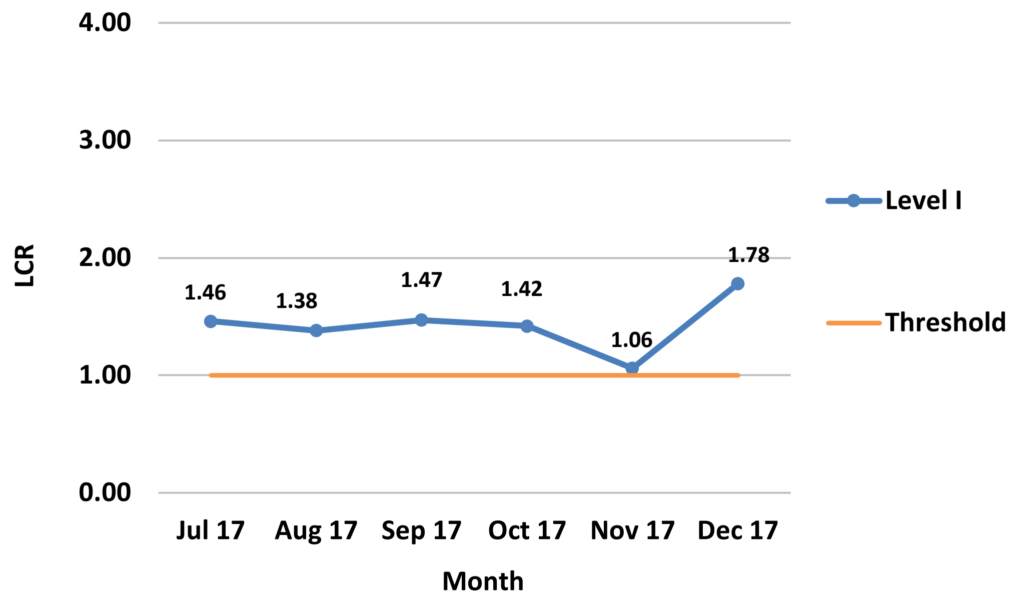


Level I: Level I LCRs were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. The increase in December was due to the timing of the cash transfer.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. July and October's LCR decrease was due to monetary credit payments. LCR fluctuations were due to monetary credit payments, which vary month to month.

Crisis Environment - 10-Day Liquidity Coverage Ratios

The 10-day LCR utilized only the available cash balance ten days prior to the payment date. In a crisis environment, CalPERS would not have access to Level III assets. The calculation assumed a five business day market lockdown as experienced on September 11th, 2001.



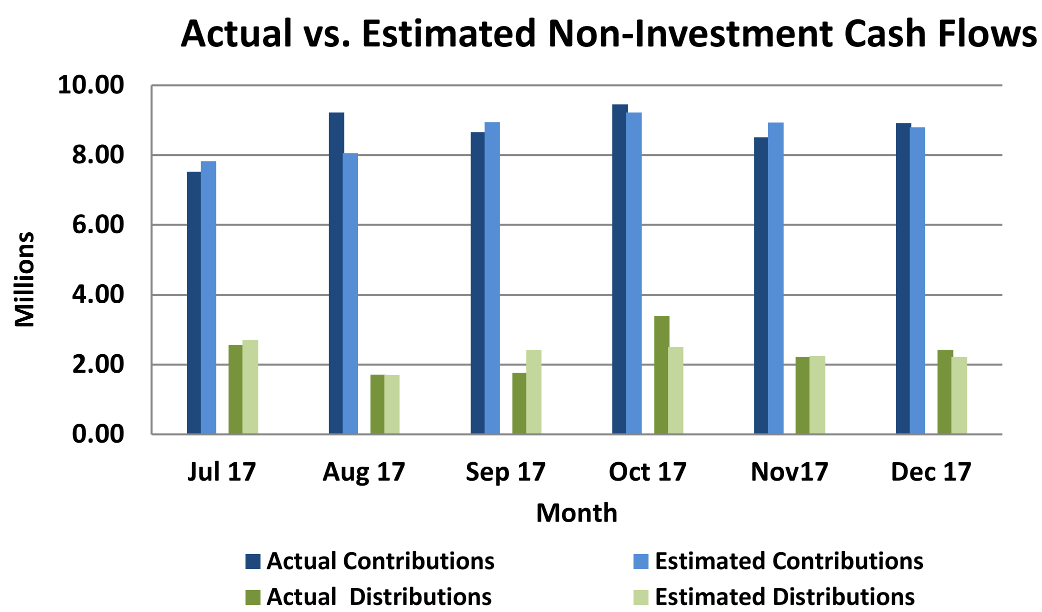
Level I: The JRF II had sufficient cash to cover obligations ten days prior to the payment date. This indicated Level I was adequate had a crisis event occurred. The increase in December was due to the timing of the cash transfer.

Overall JRF II Liquidity Health

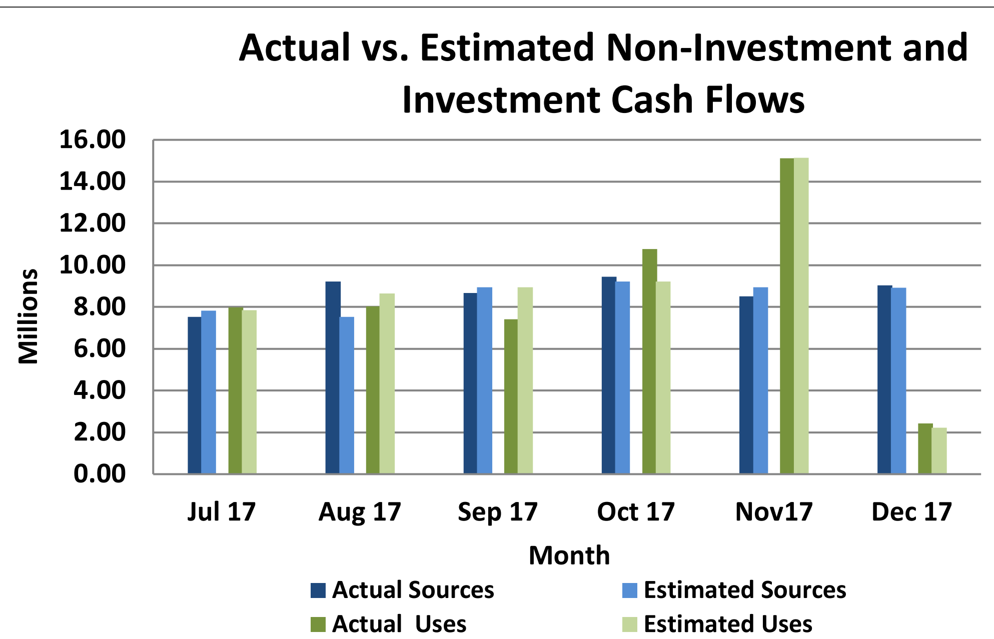
Coverage Ratio Analysis:

- ✓ JRF II was able to make payments for benefits and operating expenses regardless of market conditions.
- ✓ JRF II's liquidity remained above the threshold in the normal environment and was adequate in both stressed and crisis environments.

JRF II Cash Flow Forecasting



July's cash flow forecasting accuracy was in the 90th percentile. August's contribution variance was due to increased State Employer Contributions. September and October's distribution variance was due to the timing of monetary credit payments.



July's cash flow forecasting accuracy was in the 90th percentile. August's sources variance was due to increased State Employer Contributions. September and October's distribution variance was due to the timing of monetary credit payments. The increase of November's uses and the subsequent decrease in December's uses was due to the timing of the monthly cash transfer.

Treasury Analysis and Liquidity Status Report

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Health Care Fund (HCF)

The HCF accounts for the activities of the CalPERS self-insured health care programs. Health premiums are collected from employers and members and used to directly pay for medical services and pharmaceutical usage.

Liquidity Coverage Ratio Analysis

$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

Funding Sources and Graph Details

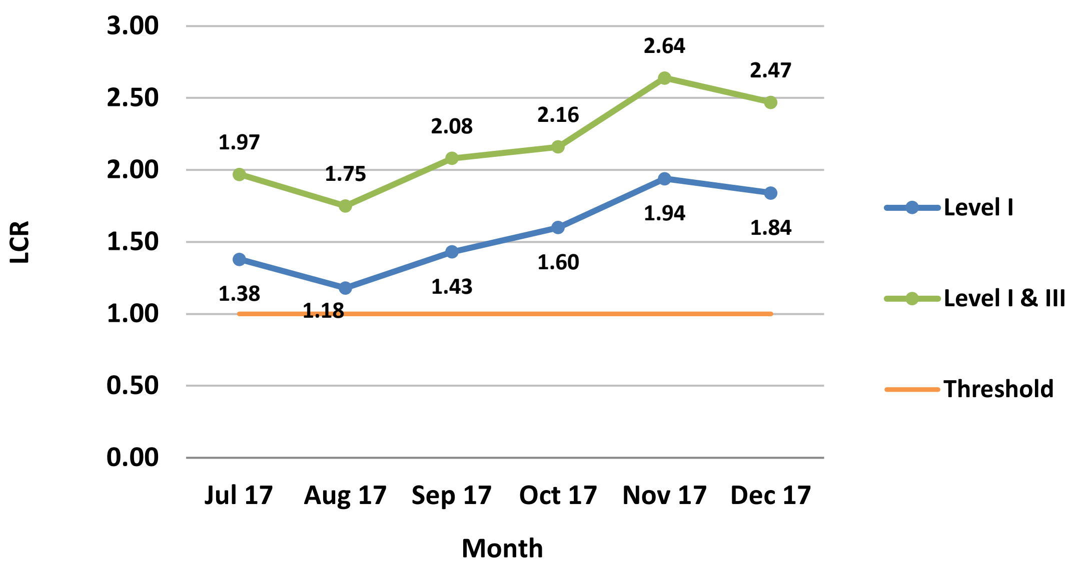
Level I: Cash and cash equivalents

Level III: Sale of public assets

Threshold: Indicates the Fund's ability to cover 100% of monthly obligations

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.

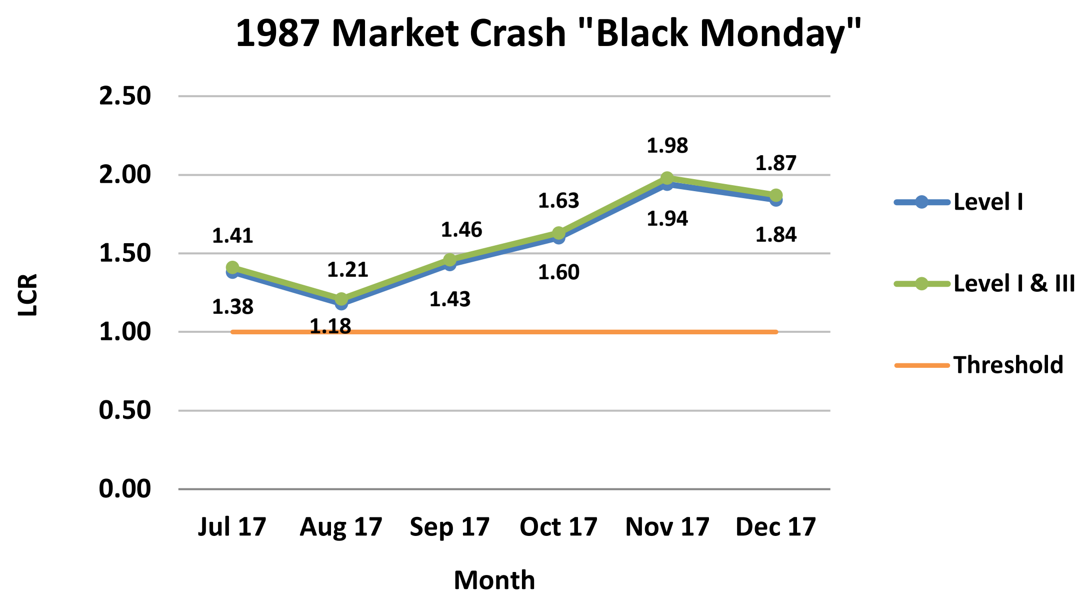


Level I: Level I LCRs remained above the threshold in July through December. The Fund maintained adequate inflows to cover monthly liabilities. The overall LCR increased due to increased reimbursements.

Level I & III: Since Level I LCRs remained above the threshold, it was not necessary to utilize Level III assets.

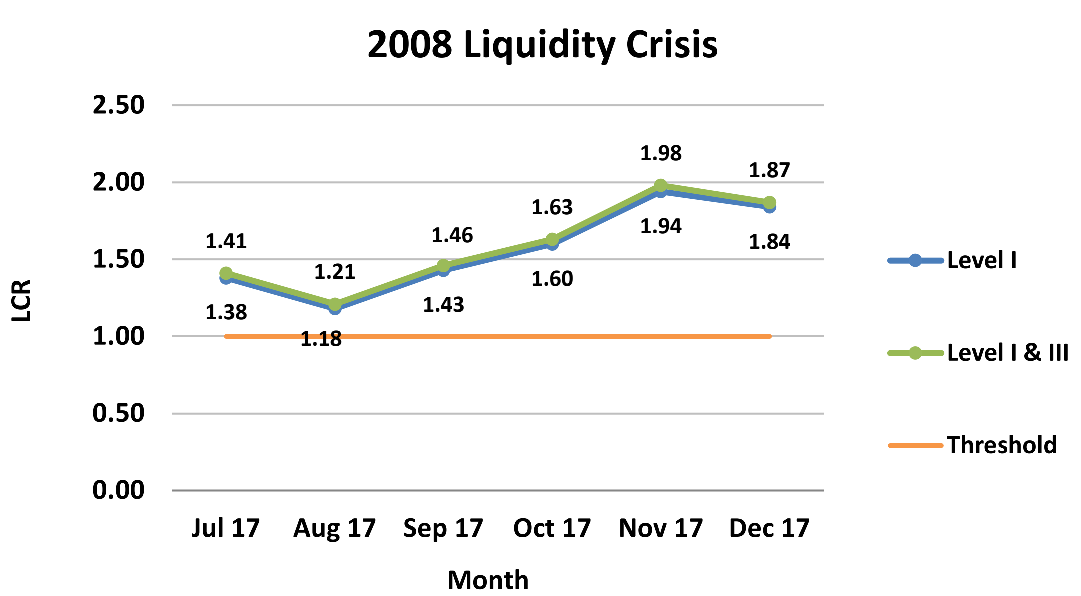
Stressed Environments - 30-Day Liquidity Coverage Ratios

Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Under the stressed scenarios, asset class sources were reduced to zero.



Level I: Level I LCRs were adequate had a stressed event similar to "Black Monday" occurred. The overall LCR increased due to increased reimbursements.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to "Black Monday" occurred. Since 100% of Level III assets for HCF were held in cash and cash equivalents and fixed income, stress factors had a minimal impact to LCRs.



Level I: Level I LCRs were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. The overall LCR increased due to increased reimbursements.

Level I & III: Level I and III assets were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. Since 100% of Level III assets for HCF were held in cash and cash equivalents and fixed income, stress factors had a minimal impact to LCRs.

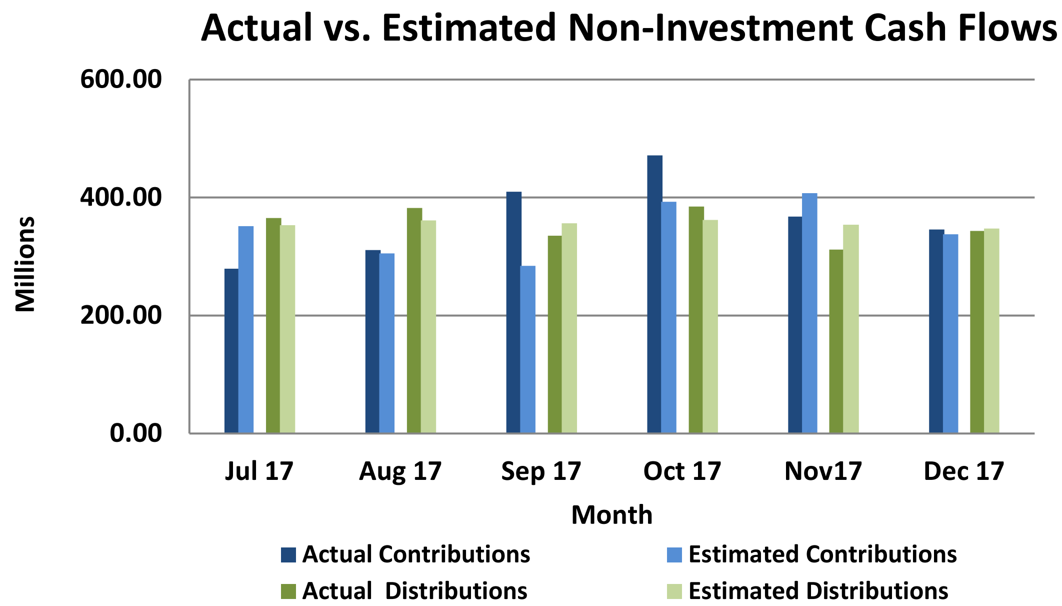
Overall HCF Liquidity Health

Coverage Ratio Analysis:

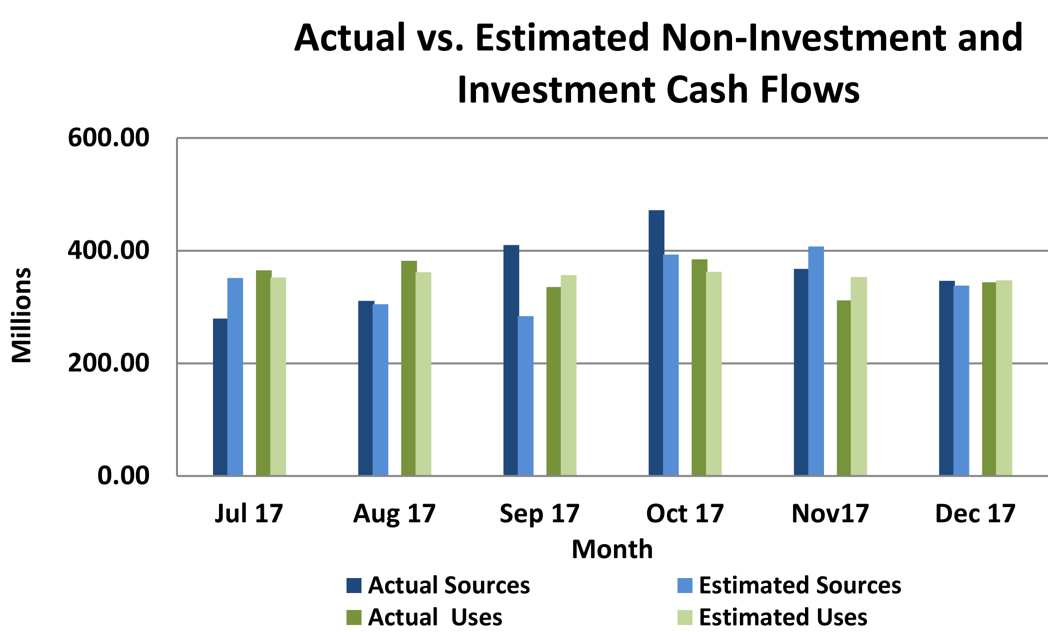
✓ HCF was able to make payments for health premiums, medical claims and operating expenses regardless of market conditions.

✓ HCF's liquidity remained above the threshold in the normal environment and were adequate in stressed environments.

HCF Cash Flow Forecasting



July's distribution variance was due to greater than expected capitation payments. September and October's contribution variance was due to increased reimbursements. November's distribution variance was due to greater than expected pharmacy claims and administrative fees. August and December cash flow forecasting accuracy was in the 90th percentile.



July's cash flow forecasting for total fund cash activities (both non-investment and investment) was slightly volatile due to greater than expected capitation payments. November's distribution variance was due to greater than expected pharmacy claims and administrative fees. August and December cash flow forecasting accuracy was in the 90th percentile.

Treasury Analysis and Liquidity Status Report

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Long Term Care Fund (LTCF)

The LTCF provides financial protection to active participants from the high cost of covered services caused by chronic illness, injury or old age. Long-Term Care products reimburse the cost for covered personal care (activities of daily living) services. LTCF participation is voluntary and benefits are funded by member premiums and the LTCF investment income. The Fund maintains a reserve to mitigate potential funding risk during a stressed environment. Please note there is a one-month delay in reporting for the LTCF.

Liquidity Coverage Ratio Analysis

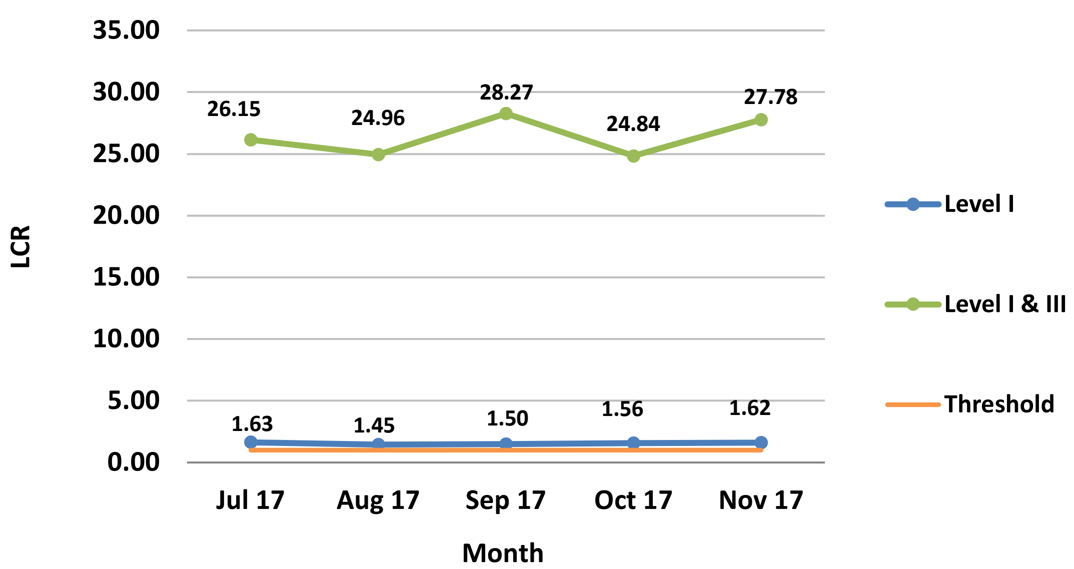
$$\text{Liquidity Coverage Ratios (LCR)} = \frac{\text{cash + assets convertible to cash + incoming cash sources}}{\text{outgoing cash uses + contingent cash uses}}$$

Funding Sources and Graph Details

Level I: Cash and cash equivalents + Reserves
Level III: Sale of public assets
Threshold: Indicates the Fund's ability to cover 100% of monthly obligations

Normal Environment - 30-Day Liquidity Coverage Ratios

The 30-day LCR included investment and non-investment available cash flows.



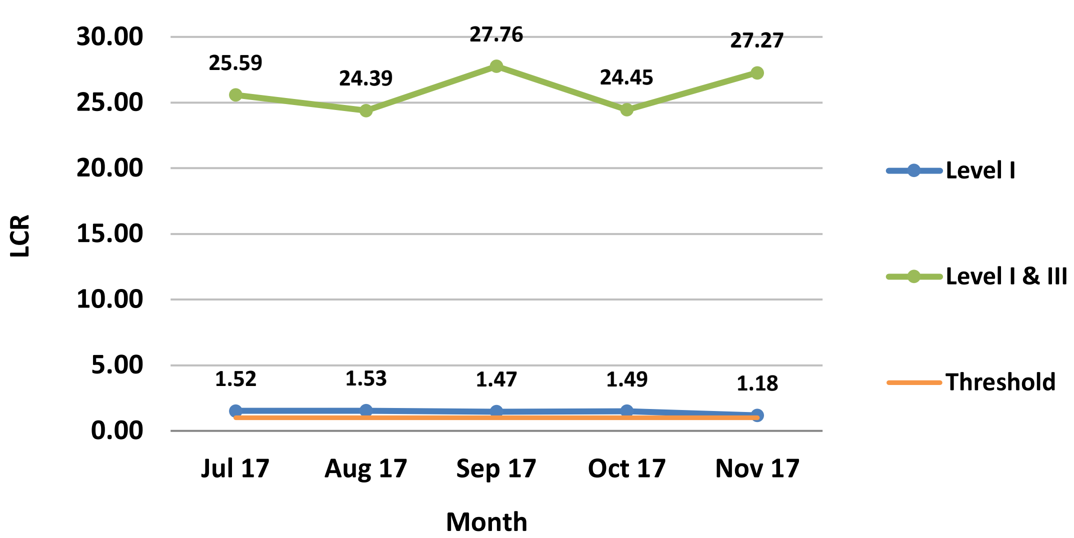
Level I: Level I LCRs remained above the threshold in July through November.

Level I & III: Since Level I LCRs remained above the threshold, it was not necessary to utilize Level III assets. Overall fluctuations are due the timing of premium payments.

Stressed Environments - 30-Day Liquidity Coverage Ratios

Stressed environment LCR scenarios were calculated assuming starting assets were stressed by the percentages actually experienced over 5 days in the 1987 market crash and 30 days during September 2008. Starting assets were further reduced by a transactional liquidity % equal to the estimated % of the assets that could have been liquidated during the 30-day period. Under the stressed scenarios, asset class sources were reduced to zero.

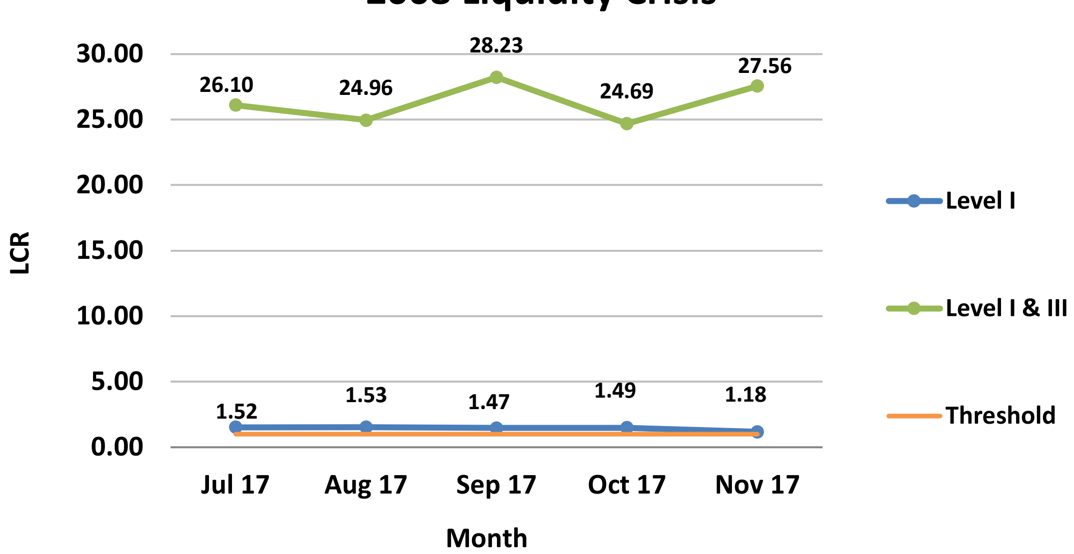
1987 Market Crash "Black Monday"



Level I: Level I LCRs remained above the threshold in July through November. In June 2017, a $4M reserve was established to ensure LCR levels are maintained above the threshold in both stressed environments.

Level I & III: Level I and Level III assets were adequate had a stressed event similar to "Black Monday" occurred. Overall fluctuations are due the timing of premium payments.

2008 Liquidity Crisis



Level I: Level I LCRs remained above the threshold in July through November. In June 2017, a $4M reserve was established to ensure LCR levels are maintained above the threshold in both stressed environments.

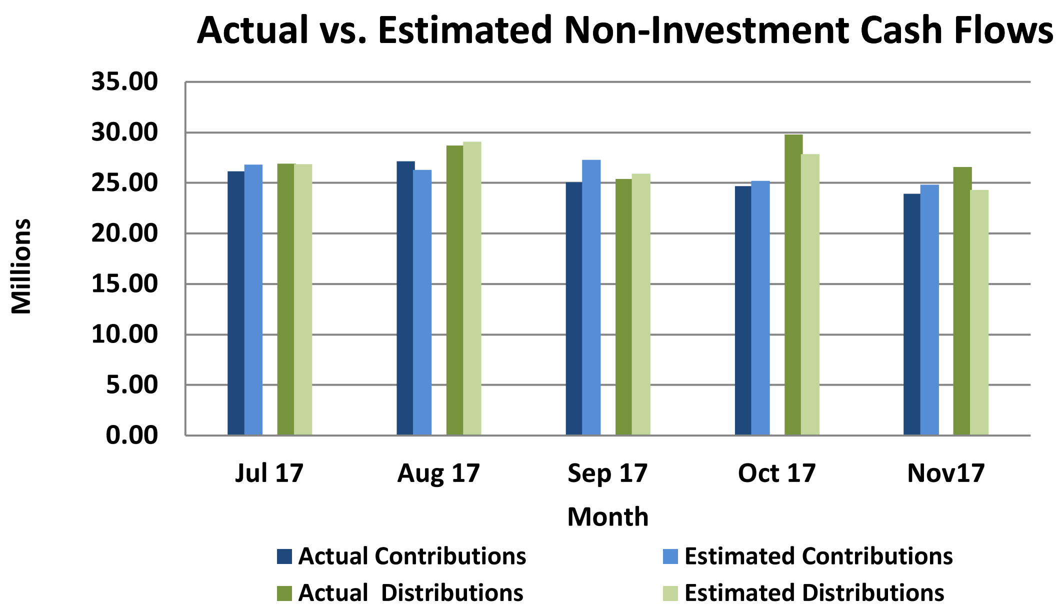
Level I & III: Level I and Level III assets were adequate had a stressed event similar to the 2008 Liquidity Crisis occurred. Overall fluctuations are due the timing of premium payments.

Overall LTCF Liquidity Health

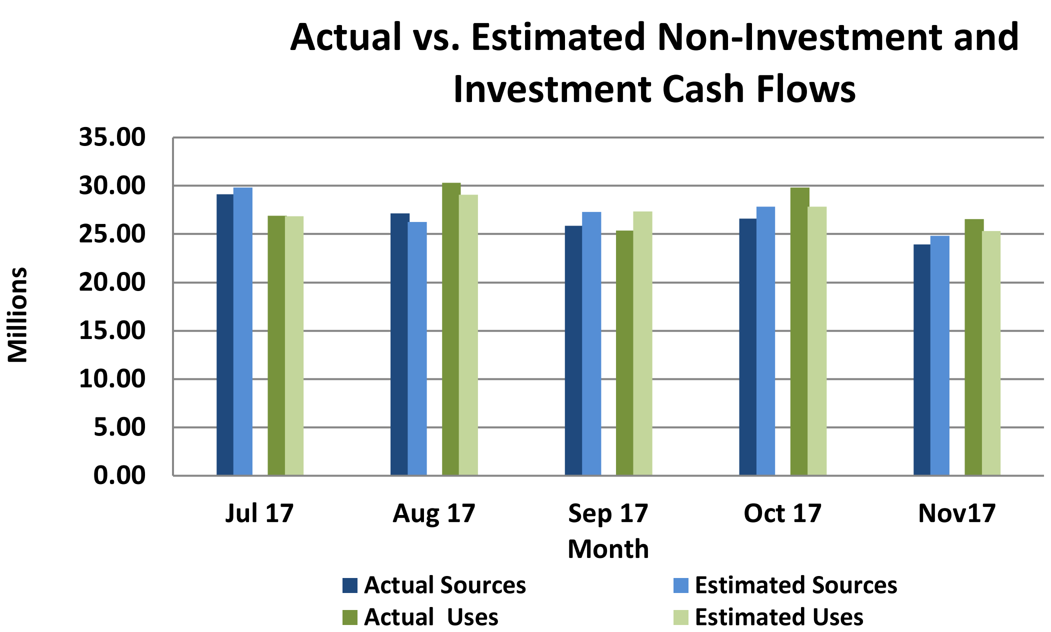
Based Coverage Ratio Analysis:

- ✓ LTCF was able to make payments for benefits and operating expenses regardless of market conditions.
- ✓ LTCF's liquidity remained above the threshold in the normal environment.

LTCF Cash Flow Forecasting



Cash flow forecasting accuracy was in the 90th percentile.



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