Cybersecurity meets the MILAF+ Fund

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Agenda

MILAF+ OVERVIEW

CYBERSECURITY THREATS

EON SECURITY ENHANCEMENTS

MARKET UPDATE & IMPLICATIONS
MILAF+ - YOUR Consortium

- Consortium started in 1987 by MASB, MASA and MSBO
- Pooling of investment dollars to improve Safety, Liquidity and Yield
- Membership includes 425 governmental entities including 387 school districts
- Total assets at June 30, 2019 were approximately $3.5 Billion (tripled in 3 years)
- AAAm rated by Standard and Poor’s
- GASB 79 Compliant – You follow GASB, shouldn’t your pool be GASB compliant?
- Not just a money market fund – full bank, cash management and investment platform
- MILAF+ was started by and governed by – YOU!

Safety in investing,

education of members and,

pragmatic solutions that meet members needs
MILAF+ - Comprehensive Cash Management Solutions
Michigan Liquid Asset Fund Plus (MILAF+) - Share Classes

For liquid investments, MILAF+ offers its investors one professionally managed portfolio with four share classes (425 members & $3.5 B in assets):

- **Cash Management Class** – Provides unlimited check writing privileges

- **MAX Class** – Offers a competitive money market rate. Requires an initial 14 day ‘aging’ period.

- **GovMic Class** - Offers a competitive rate organized exclusively for Michigan municipal entities, including counties, municipalities, and townships/villages

- **MILAF+ TERM** - is a fixed rate investment that offers terms from 60 days to one year and designed to match the cash flow requirements of Investors with the cash flows from the portfolio

All share classes stress “safety of principal” and the portfolio comprising the three share classes is rated AAAm by Standard and Poor’s*

*Standard & Poor’s fund ratings are based on analysis of credit quality, market price exposure and management. According to Standard & Poor’s rating criteria, the AAAm rating signifies excellent safety of invested principal and a superior capacity to maintain a $1.00 per share net asset value. However, it should be understood that the rating is not a market rating nor a recommendation to buy, hold or sell the securities.
Cybersecurity Threats
Cybersecurity Threats and What They Could Cost Your Entity

- **Average cost of a data breach** - $3.86 million dollars
- **Global cost of online crime** is projected to be $6 trillion by 2021
  - Attacks are growing by more than **350% annually**
- **Popular attacks that take place:**
  - Social Engineering
    - phishing emails
  - Impersonation Fraud
  - Ransomware
    - Increasing in popularity, especially with the invention of cryptocurrencies

Existing Account Features
Tools That Help Investors Follow Industry Best Practices

- **Multi-factor Authentication**
  Helps to confirm only authorized individuals are accessing confidential account information and protects against data breaches commonly related to compromised login credentials.

- **EON Messaging Center**
  Allows investors to upload documents within a password-protected portal.

- **Customized account permission**
  Allows for separation of duties and proper oversight.

- **Confirmation report**
  Summarizes daily account activity.
Multi-Factor Authentication

Multi-Factor Authentication (MFA) is a security protocol that requires verification factors to supplement a username and password. MFA is offered through EON and is another key step in our efforts to provide our investors with simple, secure and effective account access.

- **Username**
  - Easy to remember
  - Easily guessed from public information
  - Least secure factor

- **Password**
  - Can be complex
  - Potential combinations are exponential (though some are more likely than others)
  - Can be repetitive across accounts, including less-secure, unrelated accounts
  - Easy-to-remember passwords can be easier to guess
  - Hard-to-guess passwords are also hard to remember and often written down

- **Additional Factor**
  - Simple yet random and new every time
  - Adds layer of security that offsets the drawbacks of a password
  - Is an extra step when logging in
Why Use Multi-Factor Authentication?

1. It can protect against some of the most common types of attacks.

Hackers can leverage any public information, from personnel listings on websites to social media and compromised databases to guess a password or username. No firewall can prevent these types of attacks; only better processes.

2. It’s a benefit of working with PFM.

We strongly encourage your participation as MFA is a voluntary safety feature designed to meet your individual needs.

3. It’s simple to setup and easy to use.

Enrollment is simple and can be set up by following the instructions posted to your EON account under the EON Enhancements link, or by contacting PFM directly. Once enrolled in MFA, access to your online account(s) will only be granted after you successfully complete two measures of identity verification (1) providing your username and password, and (2) entering the auto-generated onetime passcode.

Multi-Factor Authentication

- Makes it difficult to impersonate a user or share login credentials
- Requires multiple methods for determining a user’s identity
- Provides protection against cyber attacks and data breaches

To learn more or enroll in MFA, please review the alert on the homepage of your EON account or select “Update Profile” and change your preferences. Please contact us if you have any questions.
EON Notification Center


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<th>What is the EON Notification Center?</th>
<th>Why is it an important tool?</th>
<th>How can it reduce account fraud?</th>
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<td>A communication tool established to notify investors of account activities. It aligns with industry best practices and helps to mitigate fraud.</td>
<td>The Notification Center provides broad account oversight by notifying investor representatives via email about key account activities. Email notifications occur on a near real-time basis.</td>
<td>Email notifications are sent to investor representatives in response to account activities. Notifications can be configured to go to multiple representatives, thus providing additional account oversight. These notifications help to ensure only authorized activities are occurring on your account(s).</td>
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How the Easy Online Network ("EON") Notification Center Works

Account Activities That Trigger An Email Notification

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<th>Account Permissions</th>
<th>View Only</th>
<th>Perform Phone &amp; EON Transactions&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Perform Wire/ACH Instruction Changes</th>
<th>Permission Changes</th>
<th>Document Uploads</th>
<th>Maturities&lt;sup&gt;2&lt;/sup&gt;</th>
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Green boxes represent all available notifications to customize user preferences.

<sup>1</sup>Individuals authorized to perform account transactions and/or wire/ACH instruction changes will automatically receive email notifications related to these account activities. Notifications related to these specific actions are not optional. They can be configured to go to multiple individuals for broader account insight.

<sup>2</sup>Notifications related to Term and CD maturities, if applicable, will be sent seven (7) days prior to the maturity date. Please note that these notifications may not affect investments.
What Individual Account Users Will Experience

- Individual users will receive email notifications in response to account activities.
- Notifications will be based on individual account permissions and how users choose to customize their preferences.
- An email notification will be sent to:
  - Individuals responsible for performing phone/EON transactions and/or wire/ACH instruction changes when one of these actions occurs.
  - Individuals who elect to receive additional optional email notifications in response to:
    - Permission changes
    - Document uploads
    - Term and CD maturities
- Email notifications will be sent within 30 minutes of applicable account activities.

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2. Notifications related to Term and CD maturities will be sent seven (7) days prior to the maturity date.
Additional Security Protocols Instituted by PFM

- **Call back verification**
  For updates to banking instructions prior to initiating a requested change

- **Mandatory internal dual-review control**
  Ensures two individuals have reviewed all requests related to opening and closing accounts and applicable maintenance items (e.g. changes to permissions and / or banking instructions)

- **Information sharing restrictions**
  We do not accept or send sensitive information via email or update account information via phone or email (appropriate forms are required)

- **Audit log**
  Provides an audit trail that PFM uses to determine details on specific user actions
Password Self-Service

EON will include a button or link for password self-service in the case that an EON user forgets his/her password.
Password Complexity

- Passwords must:
  - Be **eight characters** or more in length
  - Include **lower case** and **upper case** letters
  - Contain at least **one number** and **one special character**

- There will be new criteria added upon each user’s first reset after the implementation
  - Cannot repeat any of the user’s past four passwords
  - Cannot contain the user’s name (first or last)
  - Cannot contain certain character strings
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<th>Security Feature</th>
<th>Description</th>
<th>Implementation Date</th>
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| Password Complexity                      | System will require users to change their password subject to increased complexity | Available 9/10, Required 9/23
Users will be prompted to change to new algorithm |
| (Upper, lower, special character, and number) |                                                                             |                                                                                      |
| Password Self-Service                    | Allows users capability to reset password on EON.                             | Available 9/10                                                                        |
| Multi-Factored Authentication (MFA)      | Users will need two levels of authentication before joining EON website.     | 4th Quarter 2019
Existing users will be pre-enrolled |
| EON Notifications                        | Automatically notifies EON users of specific activities (outbound wire initiation, etc.) | Currently in place                                                                   |

Note: EON – Easy Online Network is the MILAF+ web portal available 24/7 for users.
Market Update
Current Market Themes

Capital markets – interest rates plummet

- U.S. Treasury yields fell for a third consecutive quarter, with maturities beyond one year falling 40 to 50 basis points in Q2. As of June 30, yields on the majority of benchmark U.S. Treasury maturities were near 18-month lows. The yield curve remained inverted, with the inversion spilling into the money markets. The Fed has since cut rates, and yields have fallen even further.

- U.S. equity markets climbed to new record highs on expectations of rate cuts. The S&P 500 returned 4.3% for the second quarter and 17.4% for the first half of 2019, marking its best first-half performance in over 20 years.

The Fed cuts rates “to insure against downside risks”

- Despite noting that “the outlook for the U.S. economy remains favorable,” the FOMC cut the fed funds rate for the first time since 2008 at its July meeting to a new target range of 2.00% to 2.25%.

- The Fed has moved from expecting rate increases this year, to a patient stance, and now to a preemptive rate cut, citing “weak global growth, trade policy uncertainty, and muted inflation.” Fed Chair Powell originally characterized the rate cut as a “mid-cycle adjustment to policy” and not “the beginning of a lengthy cutting cycle;” however, the market is now pricing 2-3 more rate cuts this year.

- Going forward, the path for interest rates remains unclear. Although consumer spending is supporting U.S. growth, consumer confidence is near all-time highs and labor market strength persists, the effects of continued trade tensions are taking a toll on the manufacturing sector and the global economy.

U.S. economic growth slows in Q2, but remains on stable footing

- After 1st quarter growth of 3.1%, U.S. GDP growth slowed in the 2nd quarter to 2.1% but still beat economists’ expectations. Personal consumption, which comprises nearly 70% of GDP, posted its strongest contribution since 2017, offsetting detractions from inventories, net exports and business investment. The current economic expansion in the U.S. is now the longest on record.

- The labor market remains strong, with near the lowest unemployment rate in five decades, although the monthly average number of new jobs added to the economy this year has fallen behind the 2018 pace.

- Mixed economic data, such as a slowdown in manufacturing and housing have created uncertainty. Fortunately, Congress recently passed a two-year budget and debt ceiling bill, alleviating some of the concern surrounding government spending issues in the short-term.
Market Jitters over Weakening Economic Data

Monthly Change in Nonfarm Payrolls

Inflation (Core PCE YoY)

Durable Goods Orders

ISM Manufacturing

Source: Bloomberg, most recent data available as of 8/09/19.
Trade Tensions with the U.S.’s Largest Trading Partners Increase

2018 U.S. Imports & Exports (Billions)

- China: $660
- Canada: $617
- Mexico: $612
- Japan: $218
- Germany: $184
- Other Countries: $1,917

Source: U.S. Census Bureau.

Total Annual Cost per Household of Tariffs on Chinese Imports

- Tariffs Instituted in 2018 (10%): $414
- Add'l Tariffs Instituted in 2019 (15%): $831
- Add'l Tariffs Announced, July '19 (10%): $?

Source: U.S. Census Bureau.
U.S. Job Growth Moderates

- The U.S. economy added 130,000 jobs in August
  - The unemployment rate remained unchanged at 3.7%, near a half-century low
  - Average hourly earnings slipped modestly to 3.2% YoY
- For the year, the economy has added an average of 158,000 jobs, less than the 2018 average of 223,000

Source: Bloomberg, as of August 2019.
Current U.S. Expansion is Long, But Sluggish

The current expansion is now the longest on record at 122 months.

Source: Bloomberg, as of 6/30/19.
Market Expects 2-3 More Rate Cuts This Year

U.S. Treasury Yield Curve Still Inverted

Source: Bloomberg, as of 9/9/2019.
S&P Rebounds After the U.S. & China Set Meeting in October

Source: Bloomberg, as of 9/6/19.

+18.8% YTD

2018 close
Questions?

If you have any questions or require additional information, please contact:

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Thank You