Personal Finance: Another Perspective

Cash Management:

Making the Pennies Count

Updated 2020/01/22

Objectives

A. Understand the importance and principles of cash management

B. Understand the different types of financial institutions, and the need to spend the time each week on your finances

C. Understand the different cash management alternatives and how to compare them?

D. Understand and create your Cash Management Plan

Your Personal Financial Plan

- Section VI: Cash Management
  - What is your vision and goals for your Cash Management Framework? (use Cash Template TT01-06)
  - Include:
    - What are you earning on your Savings? What costs/fees are you paying? What are you earning on your Checking? What costs/fees are you paying?
  - What Plans and strategies will you use with cash management?
    - How many month’s expenses will you have and which assets?
  - What are your constraints and accountability?

Case Study

- Data
  - Bill and Suzy are married, both 25, and will be making a combined $96,000 upon graduation. Bill is in sales, so they consider a 4 month Emergency Fund a priority. They have two priorities:
    - 1. Ensure they are not loosing too much return to inflation, and
    - 2. Since Suzy is expecting, they are would like to save for their new child's education as well.
  - Application
    - What cash management instruments would you recommend they use given their priorities, and how would you recommend they divide out their Emergency Fund assets?

A. Understand the Importance and Principles of Cash Management

- What is cash management?
  - The management of cash and liquid assets to help you meet your personal goals
    - It is "a penny saved is a penny earned" as guided by Benjamin Franklin
    - It is the process of "we take care of the pennies, and the dollars will take care of themselves" (Anonymous)

Importance and Principles (continued)

- How can it help achieve your goals?
  - Want to save more money?
    - *Automate Savings*: Pay yourself second and do it through payroll deductions or automatic deposits into your mutual fund accounts
  - Want to shorten your time working on finances?
    - *Use cash management/budgeting software*: Use programs such as Intuit's Quicken or Mint.com
  - Want to be a better steward?
    - *Use electronic record keeping*: Perhaps move to an electronic system to keep better records of your finances, i.e., Quicken, Mint, YNAB, etc.

Importance and Principles (continued)

- What is an Emergency Fund?
  - It is a resource that can be used to meet unexpected needs for cash
  - The traditional rule of thumb is for it to be sufficient liquid assets to cover 3-6 months of expenses (I changed it to be the larger of expenses or income to take into account the needs of students)
    - You need an emergency fund so you won't need to tap into long-term money to meet current expenses

Importance and Principles (continued)

- What are the principles of Cash Management?
  - 1. Know yourself, your goals, vision and budget
  - 2. Seek, receive and act on the Spirit's guidance
  - 3. Understand the key areas of cash management and develop a plan how you will manage liquid assets
  - 4. Seek for the highest return in terms of after-tax and equivalent taxable yield, consistent with your safety, interest rate, risk tolerance and liquidity requirements
  - 5. Monitor and revise your strategy as necessary to meet your changing personal and other conditions

Importance and Principles (continued)

- Finding Balance

Guiding Principles	Doctrines
Know yourself, your vision and goals	Identity
Seek, receive and act on guidance	Obedience
Understand the key areas of C.M.	Stewardship
Seek for highest return (R_{AT} or ETY)	Agency
Monitor and revise as necessary	Accountability

Importance and Principles (continued)

From obedience to consecration

- I am a child of Heavenly Parents (identity), living as I know how (obedience), using the talents and skills I have been blessed with (stewardship). I have a Plan to be wise stewards over our short-term finances (agency), particularly the small things which can add up over time (accountability), so that I can accomplish my personal mission and my individual and family vision and goals

Questions

- Any questions on the importance and principles of Cash Management?

B. Understand Types of Financial Institutions and the Importance of Spending Time with Your Finances

- There are two main types of institutions (but the distinction is blurring through deregulation)
  - "Banks" or deposit-type financial institutions
  - Non-deposit-type financial institutions
- The choice of which one you use depends on which will serve your needs the best

Financial Institutions (continued)

- Deposit-type Financial Institutions
  - Commercial banks
    - Widest variety of services, so generally do not offer the highest rates
  - Savings and loan associations
    - Slight ownership differences, but essentially similar to commercial banks but higher rates.
  - Credit unions
    - Similar to above, but since not-for-profit, can offer sometimes higher rates on savings
  - Internet or “Net” banks
    - Electronic banks with no local network so they have lower costs and can offer higher rates.

Financial Institutions (continued)

- Non-deposit Type Financial Institutions
  - Mutual fund companies
    - You can write checks on your mutual fund account
  - Stockbrokerage firms
    - You can write checks on your brokerage account
- Now both banks and non-banks can offer on-line financial services which allow access to bank balances and some resources 24 hours a day.
  - There has been a major blurring of roles between deposit and non-deposit institutions:

Financial Institutions (continued)

- Choosing a Financial Institution—the three Cs
  - The Cost Factor
    - Monthly fees, minimum balance, check charges, balance-dependent scaled fees, rates on savings
  - The Convenience Factor
    - Location (branches, ATMs), safety deposit boxes, overdraft protection, stop-payment ability
  - The Consideration Factor
    - Personal attention, advice, attention to detail, FDIC insured, allow Quicken direct-connect
  - Note that whatever institution you choose, it is your responsibility to make sure they do what they say

Spending the Time Each Week

- Application taxes times
  - Realize the importance of spending time each week with your finances
    - While technology can help, unless you plan and spend at least 1-2 hours a week planning and evaluating your finances, you will likely not be able to attain with your financial goals.
      - Plan the time necessary and use that time wisely

Spending Time (continued)

- From the book, the Millionaire Next Door it states:
  - People who become wealthy allocate their time. . . in ways consistent with enhancing their net worth. [They] allocate nearly twice the number of hours per week to planning their financial investments as [those who do not become wealthy] do. (Thomas Stanley and William Danko, The Millionaire Next Door, Pocket Books, 1996, p. 71)
- Unless you are spending 1-2 hours a week on your financial planning and reporting (i.e., budget, investing, retirement process, etc.), it may be difficult to reach your goals
  - Make the decision now to spend the time!

Questions

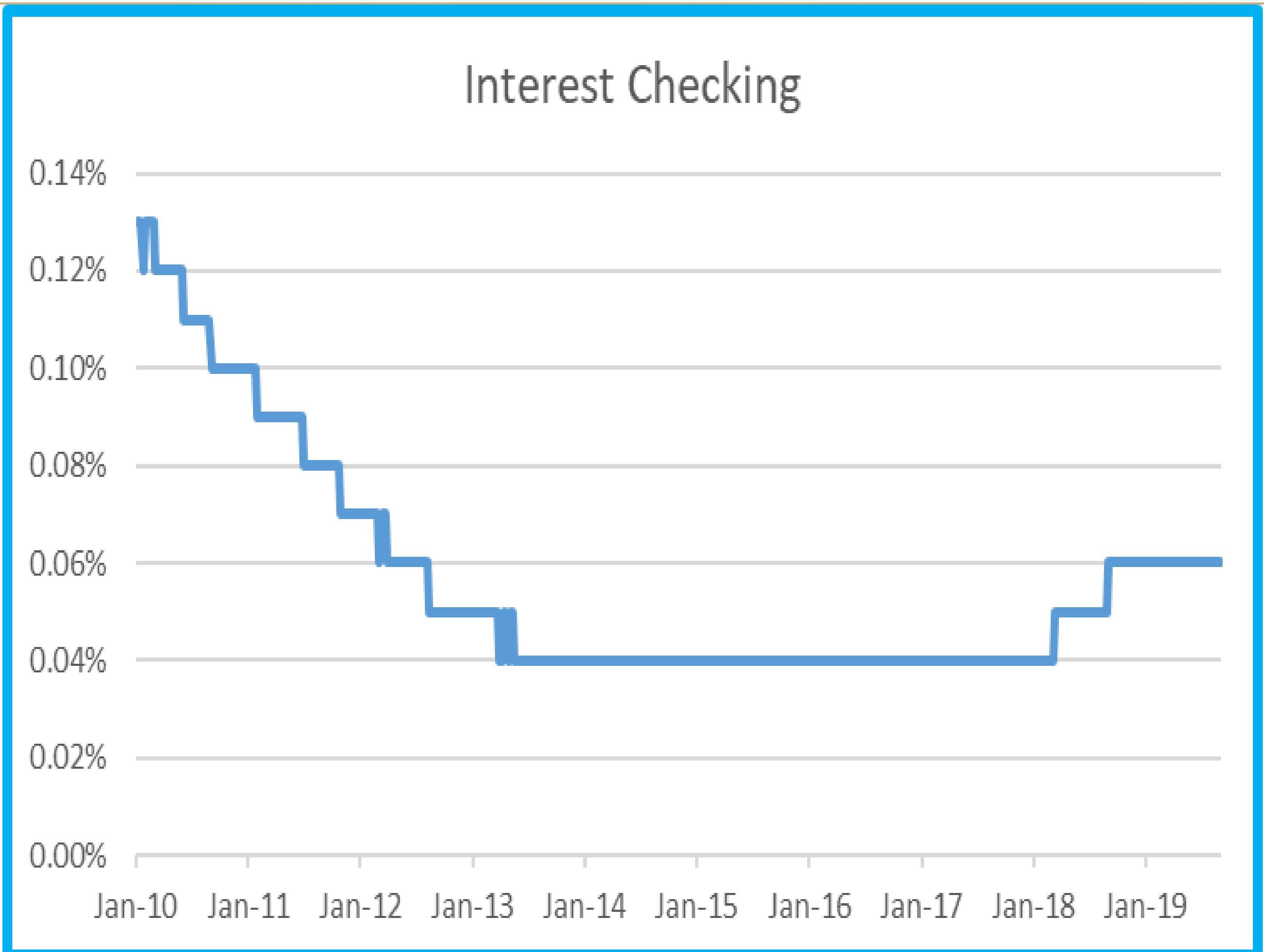
- Any questions on financial institutions and the importance of spending time each week on your finances?

C. Understand Your Cash Management Alternatives

- There are lots of alternatives, each of which has their benefits and costs
  - Traditional cash management assets
    - Checking accounts
    - Savings accounts
    - Money market accounts
    - Certificates of deposit
  - Less traditional assets
    - Money Market and short-term bond Mutual Funds
    - U.S. Treasury bills
    - U.S. Savings bonds (Series EE/I)
    - Note: Graphs are from FRED.org as of 2020/01/20

Cash Management (continued)

- Traditional Cash Management Instruments
  - Checking accounts (interest bearing)
    - Liquidity: Very liquid, daily
    - Required minimum balances: low
    - Interest rates: Fixed, but minimal, currently .05% to 1.0%
    - Safety and Taxes: FDIC insured, all taxable
    - Penalties for early withdrawal: No
    - Source of information: Bloomberg, banks and credit unions, bankrate.com
    - How to invest: contact a bank or other financial institution to set up an account



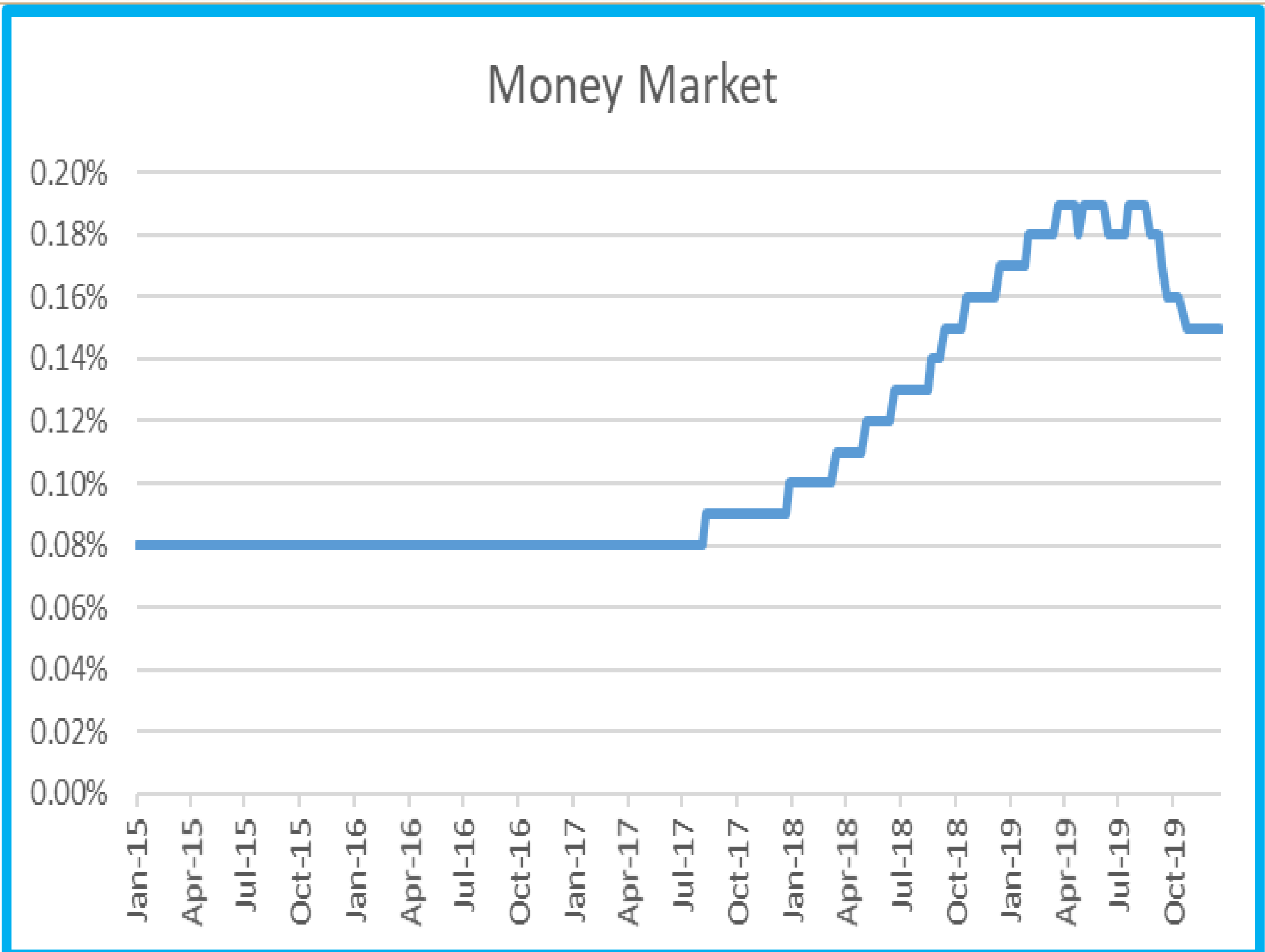
Source: St. Louis Federal Reserve at Fred.org 2020/01/22

Cash Management (continued)

- Savings accounts
  - Liquidity: Very liquid, daily
  - Required minimum balances: Low
  - Interest rates: Fixed, but minimal, currently 0.05% to 2.0%
  - Safety and Taxes: FDIC insured, all taxable
  - Penalties for early withdrawal: No
  - Source of information: traditional and internet banks, savingsaccounts.com
  - How to invest: Contact a bank or other financial institution to set up an account

Cash Management (continued)

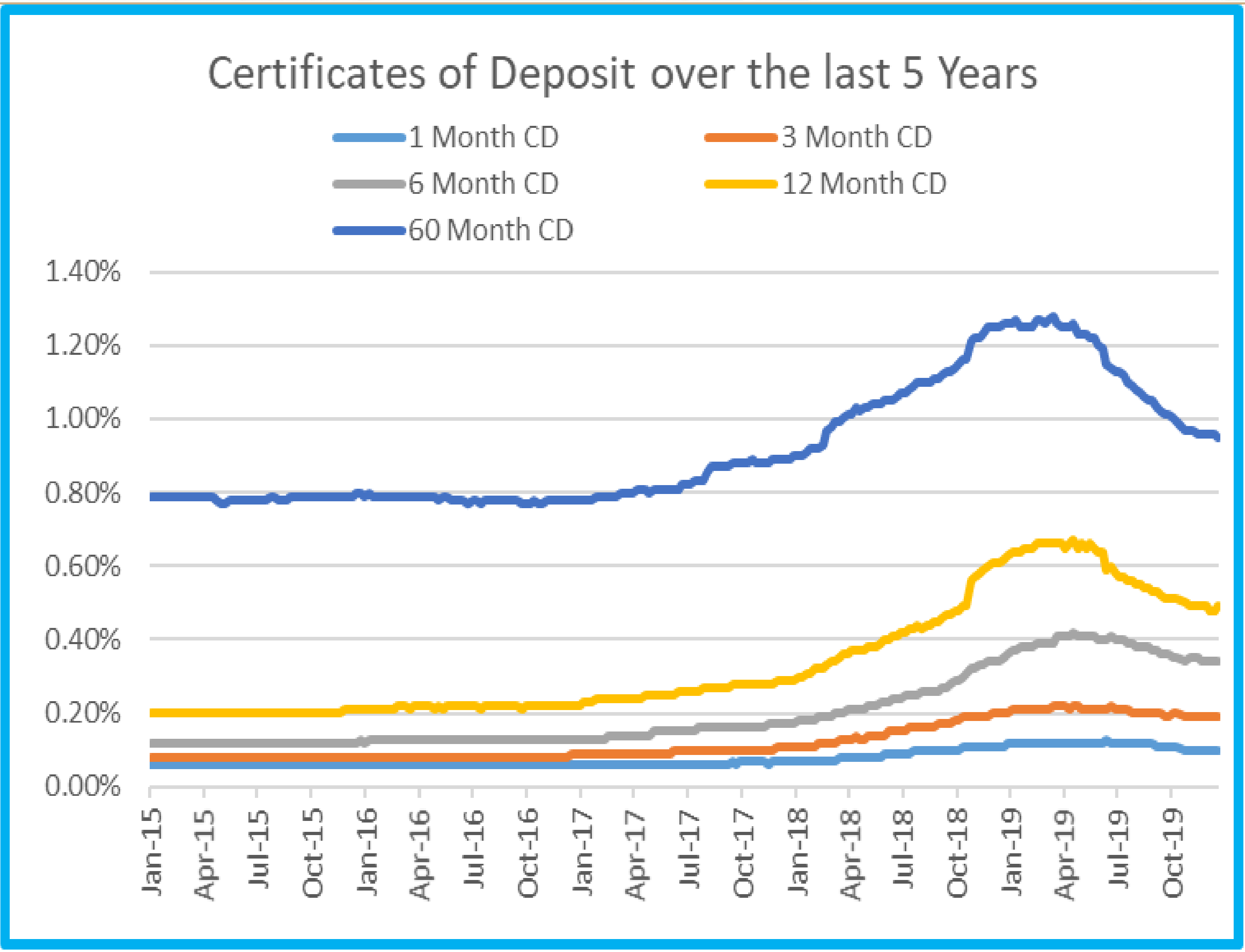
- Money Market Accounts (MMA)
  - An alternative to a bank's savings account
    - Liquidity: Very liquid, daily
    - Required minimum balances: Higher
    - Interest rates: Variable, but higher than savings, 0.25% - .60%
    - Safety: Very – FDIC insured
    - Safety and Taxes: FDIC insured, all taxable
    - Other features: Limited check writing
    - Penalties for early withdrawal: No
    - Source of information: WSJ, Credit Markets
    - How to invest: contact a financial institution



Source: Fred 2020/01/22

Cash Management (continued)

- Certificates of Deposits (CDs)
  - Pays a fixed rate of interest for a fixed period of time
    - Liquidity: Less liquid, generally monthly, depending on maturity
    - Required minimum balances: Higher
    - Interest rates: Higher rates, 1m 0.10%, 3m 0.19%, 6m 0.34%, 1 year 0.49%, 5 year 0.95%
    - Safety: Very – FDIC insured
    - Other features: None
    - Penalties for early withdrawal: Yes
    - Source of information: WSJ Bankrate.com, FRED.org
    - How to invest: Contact a financial institution to purchase a CD



Source: Fred.org 2020/01/22

Cash Management (continued)

- Money Market Mutual Funds (MMMFs),
  - Pool funds from many investors to buy higher yielding debt securities
    - Liquidity: Very, daily
    - Required minimum balances: Much higher
    - Interest rates: Slightly higher than MMAs
    - Safety and Taxes: Not FDIC insured, all taxable
    - Other features: Limited check writing, charge administrative fees, bought by the share
    - Penalties for early withdrawal: No
    - Source of information: Brokers, bankrate.com
    - How to invest: contact a mutual fund company to set up an account and purchase a fund

Cash Management (continued)

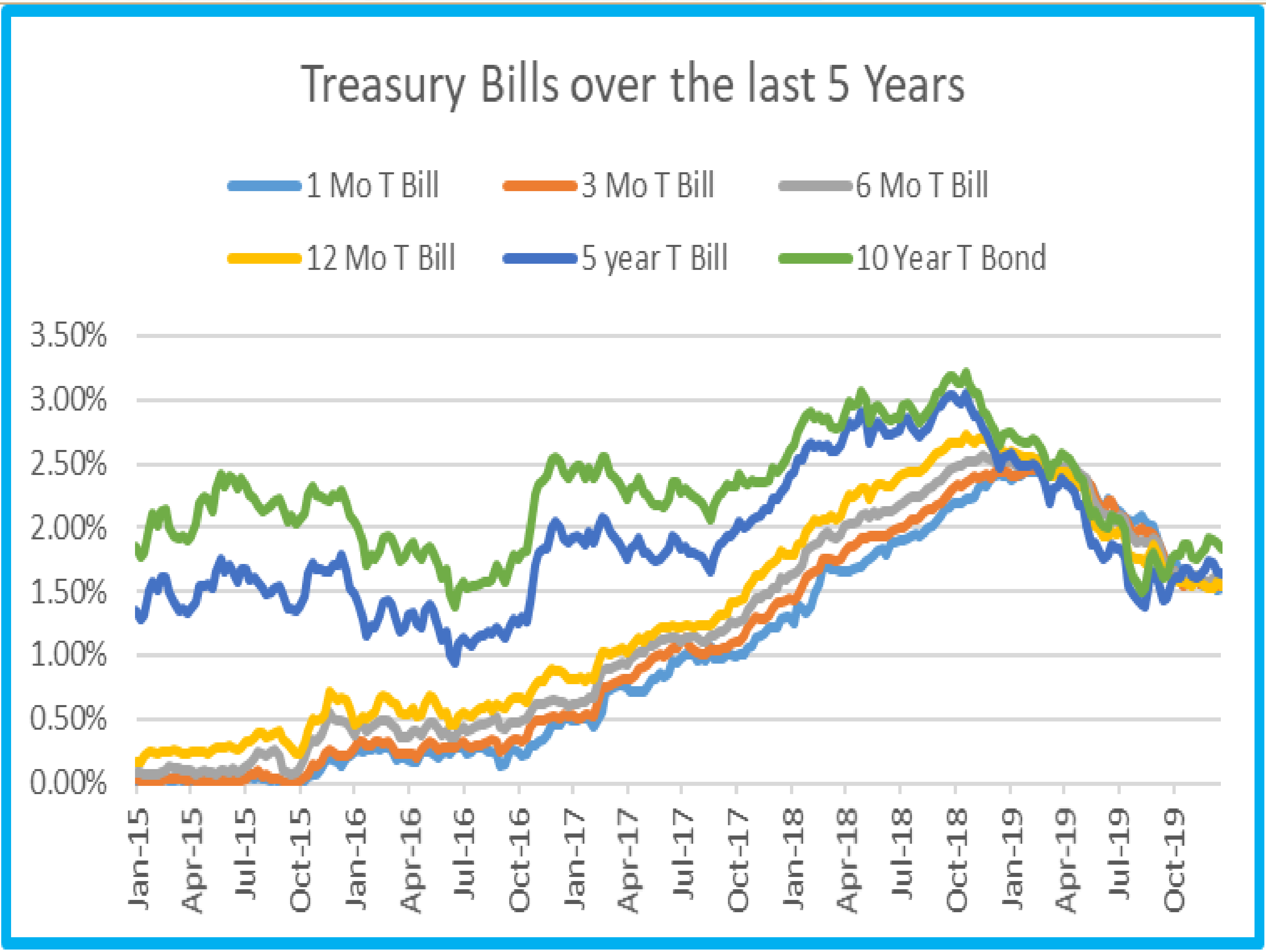
- Short-term Bond Mutual Funds
  - Pool funds from many investors to buy higher yielding debt securities, less than 1 year maturity
    - Liquidity: Very, daily
    - Required minimum balances: Much higher
    - Interest rates: Slightly higher than MMMFs
    - Safety and Taxes: Not FDIC insured, all taxable
    - Other features: Limited check writing, charge administrative fees, bought by the share
    - Penalties for early withdrawal: No
    - Source of information: Brokers, bankrate.com
    - How to invest: contact a mutual fund company to set up an account and purchase a fund

Cash Management (continued)

- Note that MM/Short-term Bond Mutual Fund returns may be either taxable or tax-free depending on the type of securities and location of the securities the mutual fund (MF) invests in.
  - If the MF invests in only government securities, the interest (not capital gains) is state tax free
  - If the MF invests in only municipal securities, the interest is federal tax free
  - If the MF invests only in municipal securities from your state, the interest may be both federal and state tax free as well (for states that have state taxes)

Cash Management (continued)

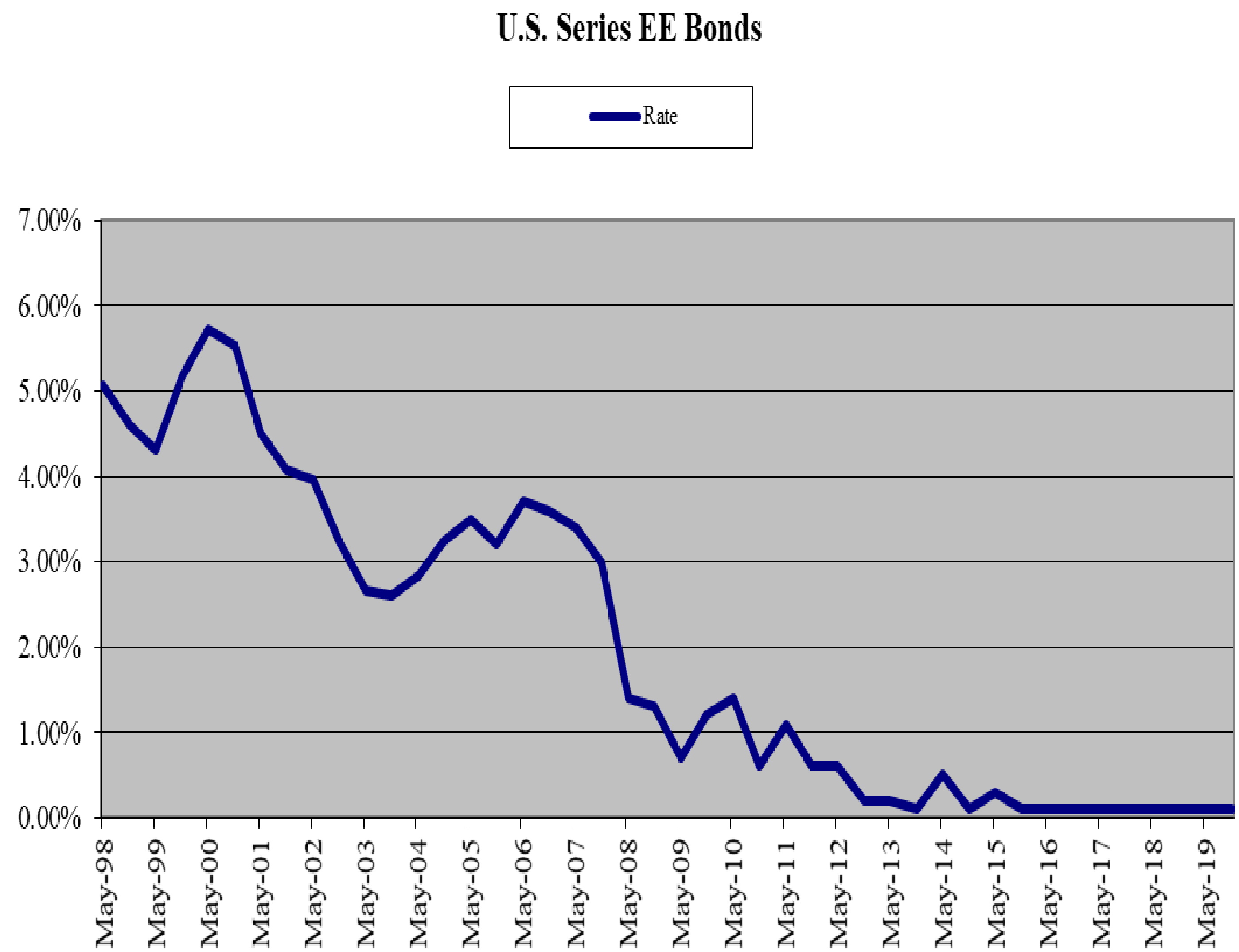
- U.S. Treasury Bills
  - Short-term, less-than 12 months, government debt
    - Liquidity: Somewhat, monthly
    - Required minimum balances: Much higher
    - Interest rates: 4W 1.52%; 13W 1.54%, 26W 1.56%, 1Y 1.54%, 5Y 1.64%, 10Y 1.84%
    - Safety: Very, guaranteed
    - Other features: state and local income tax exempt on interest, and purchased at a discount, but don't accrue periodic interest payments
    - Penalties for early withdrawal: Yes
    - Source of information: FRED database 2020/01/20 http://www.wsj.com/public/page/news-fixed-income-bonds.html
    - How to invest: 3 or 6 month bills can be purchased from www.treasurydirect.gov, banks and brokers



Source: Fred.org 2020/01/22

Cash Management (continued)

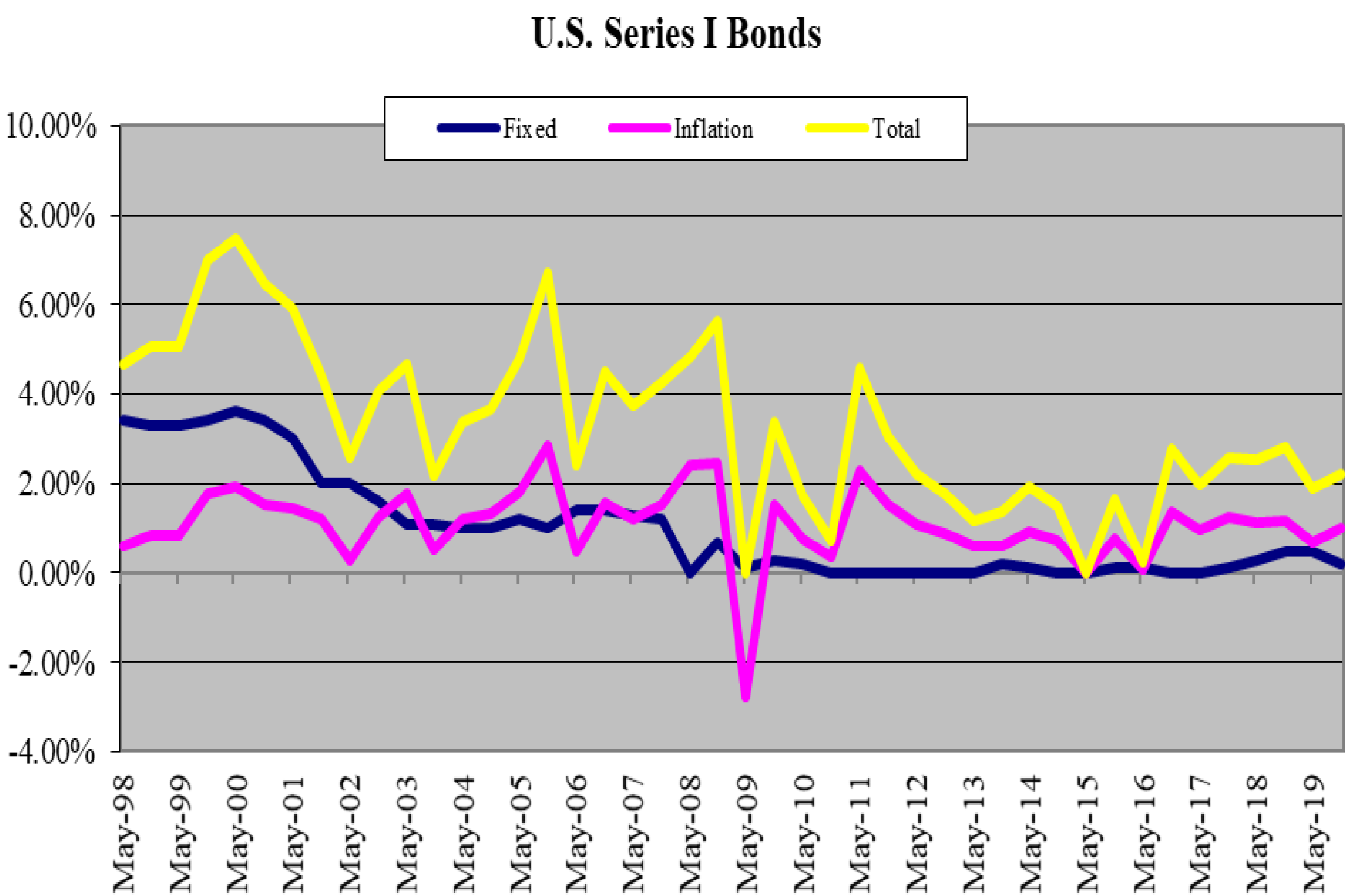
- U.S. Series EE Savings Bonds
  - US government savings bonds
    - Liquidity: Only after 5 years. Must hold 1 year
    - Required minimum balances: Higher
    - Interest rates: Previous rates were variable. Now they are fixed at 0.1% through April 2020
    - Safety: Very
    - Other features: State and local income tax exempt, interest tax-free if spent on eligible college tuition, sold in $25 to $10,000 bonds
    - Penalties for early withdrawal: 3 month before 5 years
    - Source of information: www.savingsbonds.gov
    - How to invest: Purchase via website, $10,000/ year plus $5,000/year paper bonds from your IRS tax refund



Source: Treasurydirect.org 2020/01/22

Cash Management (continued)

- U.S. Series I Savings Bonds (inflation linked)
  - US government savings bonds
    - Liquidity: Very, after 5 years. Must hold at least 1 year
    - Required minimum balances: Minimal ($25)
    - Interest rates: inflation linked, 2.22% until April 2020
    - Safety: Very, guaranteed
    - Other features: Taxed only in year cashed, interest tax-free if spent on eligible college tuition, interest income free from state and local taxation, sold in $25 to $10,000 bonds
    - Penalties: Yes, 3 month penalty before 5 years
    - Source of information: www.treasurydirect.gov
    - How to invest: Purchase via website, $10,000/ year plus $5,000/ year in paper bonds from your IRS tax refund



Source: Treasurydirect.org 2020/01/22

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US Series EE/I Bond Income Limits

- If your Modified Adjusted Gross Income is above specified limits in the year bonds are cashed, you cannot exclude the interest income from your income taxes. The limits are:

Year	Filing Single	Married Filing Jointly
2016	$77,550-92,550	$116,300-146,300
2017	$78,150-93,150	$117,250-147,250
2018	$79,700-94,700	$119,550-149,550
2019	$81,100-96,100	$121,600-151,600
2020	$82,350-97,350	$123,350-153,550

- Your modified Adjusted Gross Income is your adjusted gross income adding back certain items such as foreign income, foreign-housing deductions, student-loan deductions, IRA-contribution deductions and deductions for higher-education costs (see IRS Form 8815)

Sources of Cash Management Information

- Graphs:
  - Bankrate.com (Firefox browser works best)
  - http://www.bankrate.com/brm/graphs/graph_trend.asp?
- Interest Rate Data:
  - Wall Street Journal: Money Rates, Consumer Rates
- U.S. Savings Bonds:
  - www.treasurydirect.gov
- Other Financial Websites
  - CNN Money, Yahoo Finance
  - BYU Libraries
  - Bloomberg

Cash Management Asset Summary Sheet 2020

MBA 620/Fin418/Fin200 Financial Planning (2020/01/22)

Assets:	Traditional				Short-term Mutual Funds		Government Bills and Savings Bonds		
	Checking	**Savings**	**Money Market (or MMDA)**	**Certificate of Deposit**	**Money Market Mutual Fund**	**Short-term Bond Funds**	**US Treasury Bills**	**EE Bonds**	**I bonds**
Description:	Deposits help at a financial institution that allows withdrawals by checks and deposits on demand; hence, it is also called a demand account.	Deposits held at a financial institution that earn interest. Internet savings rates generally higher	A savings account that typically earns rates and that pays interest based on current money market interest rates. These have higher minimum balances.	Savings certificates with fixed maturity and interest rate, and can be issued in any denomination. Access to the funds is restricted until maturity date	An open-end mutual fund that invests in very short-term debt securities such as US treasury bills, municipal bonds, or commercial paper.	An open-end mutual fund that invests in short-term corporate bonds, municipal bonds, or Treasury securities with maturities less than one year.	Short-term US government debt obligations sold with different maturities and issued at a discount from par. Investors receive interest at maturity.	US government savings bonds where the interest rate is set every 6 months and tied to current market interest rates.	US government savings bonds with interest rates linked to US inflation and in which rates are set every 6 months
Liquidity:	Very liquid, daily	Very liquid, daily	Very liquid, daily	Fixed maturity on CDs	Somewhat liquid, get money in 3 days	Somewhat liquid, get money in 3 days	Somewhat liquid depending on maturity	After 12 months redeem at any bank	After 12 months redeem at any bank
Required Minimum Balances:	None	Low to none	Higher required minimum balances	Higher required minimum balances	Depends on mutual fund requirements	Depends on mutual fund requirements	Higher minimum balances	May purchase in denominations from \$25 to \$10,000	May purchase in denominations from \$25 to \$10,000
Interest Rates:	.05% - 1.0%	.05% - 1.0%, Internet .3% - 1.5%	.1% - 1.0%	1M: .10%, 3M: .19%, 6M: .34%, 1Yr: .49%, 5 Yr: .95%	Higher than MMA, .25-.5% depending on market conditions	Higher than MMMF, .35-.8% depending on market conditions	1M: 1.52%, 3M: 1.54%, 6M: 1.26%; 1Y: 1.54%, 5Y: 1.64, 10Y: 1.84%	Rates are reset every 6 months and are 0.1% through April 30, 2020	Rates are reset every 6 months and are 2.220% through April 30, 2020
Taxes:	Federal and State	Federal and State	Federal and State	Federal and State	Bonds - all taxable; Muni bonds - Fed. tax-free, if from your state - all tax free; US Treasuries - State tax free	Bonds - all taxable; Muni bonds - Fed. tax-free, if from your state - all tax free; US Treasuries - State tax free	State tax free	State tax free. If principle and interest used to pay for college tuition, then both Federal and State tax free	State tax free. If principle and interest used to pay for college tuition, then both Federal and State tax free
Safety:	FDIC insured	FDIC insured	FDIC insured	FDIC insured	Not FDIC insured but very short-term (<30 days)	Not FDIC insured but very short-term (< 1 year)	Not FDIC insured but a US debt obligation	Not FDIC insured but a US debt obligation	Not FDIC insured but a US debt obligation
Early Withdrawal Penalties:	None	None	None	Yes	None	None	Yes	Must hold 12 months then 3 months interest penalty before 5 years	Must hold 12 months then 3 months interest penalty before 5 years
Other features:	None	None	May have limited check writing	None	May have limited check writing	None	None	If proceeds used for tuition, then state and federal tax free	If proceeds used for tuition, then state and federal tax free
How to invest:	Contact a bank or other financial institution	Contact a bank or other financial institution	Contact a bank or other financial institution	Contact a bank or other financial institution	Contact a no-load mutual fund company to invest	Contact a no-load mutual fund company to invest	Purchase from www.treasurydirect.gov, banks and brokers	Purchase from www.treasurydirect.gov, \$10,000 per year plus \$5,000 from tax refund. Income limits apply	Purchase from www.treasurydirect.gov, \$10,000 per year plus \$5,000 from tax refund. Income limits apply

Comparing Cash Management Alternatives

- How do you compare different cash management alternatives?
  - 1. Use comparable interest rates
    - Look at the Annual Percentage Yield (APY)
      - The APY (similar to the APR), is the yield or return number you should use when comparing different cash management alternatives. It takes into account the effect of compounding
        - $APY = (1+[APR/Periods])^{\wedge Periods}-1$
    - Financial institutions are required by law to state the APY which converts the different interest rates into similar compounding periods

Comparing Alternatives (continued)

2. Calculate after-tax returns and Equivalent Taxable Yields (ETY)
   - a. Calculate the after-tax return for taxable assets
     - After tax return = taxable return * (1- tax rate)
       - Tax rate = Marginal (Federal + State + Local) tax rate
   - b. Calculate the equivalent taxable yield (ETY) for tax-advantaged assets
     - The ETY is the yield that is offered on a comparable taxable bond to give the same after-tax yield as a tax-advantaged security.
       - ETY = return after tax / (1 – (marginal tax rate))
   - For help, see After Tax ETY (LT26)

Comparing Alternatives (continued)

3. Calculate real returns, i.e., returns after inflation
   - Calculate your return after the impact of inflation
     - Use the correct formula for calculating real or after-inflation returns
       - Real return = $\frac{(1 + \text{nominal return})}{(1 + \text{inflation})} - 1$
     - If you are calculating after-tax after-inflation returns, your nominal return above would be your after-tax return
     - Remember, inflation linked bonds, such as Series I bonds, take into account changes in inflation when determining yields

Comparing Alternatives (continued)

4. Consider safety
   - Some alternatives are explicitly or implicitly guaranteed by the government up to $250,000
     - Others have no guarantee
5. Consider maturity and interest rate adjustment periods
   - Consider the maturity of the instrument
   - Consider how often the interest rate could change and the potential impact of those rate changes

Comparing Alternatives (continued)

Your choice of cash management asset depends on:

- 1. Your goals and risk tolerance
  - What is the purpose for this money?
- 2. The type of asset preferred
  - CDs, MMA, MMMF, Savings bonds?
- 3. Your tax situation
  - What is your marginal tax rate?
- 4. The location of the financial assets
  - Muni's from your state?
- 5. Your use of the funds
  - Used for tuition at a qualified school?

Questions

- Do you understand cash management alternatives and how to compare them?

D. Understand and Create Your Cash Management Plan

- How to develop a Cash Management Plan?
  - 1. Decide how many months of expenses you want
    - Generally, 3 to 6 months is recommended (which is the time it takes to get another job)
  - 2. Decide how you will divide your investments between the various cash management assets
    - Using a month's expenses is a good guide
  - 3. Diversify your cash management assets based on risk and return
    - Try to get the highest return at your level of liquidity, safety, and risk
    - Using additional assets discussed can help

Your Cash Management Plan (continued)

- Vision
  - Likely from your Plan for Life
  - Other ideas include:
    - Have liquidity for short-term needs, and keep additional funds invested for higher returns
- Goals
  - Always keep a 4 month Emergency Fund, and replenish it immediately back to target levels
  - Pay off all credit cards monthly and pay no interest
  - Strive for the highest interest rates consistent with my level of risk
  - Keep up with inflation with short-term funds

Cash Management Plan (continued)

- Plans and Strategies
  - Auto pay a specific amount monthly into saving/investing
  - Diversify short-term instruments in checking, saving, CDs, US Savings Bonds, and short-term bond funds
  - Have 3 months expenses in my Emergency fund, with 1 month in checking, 1 month in savings/CD (for higher interest), and 1 month in a no-load short-term bond fund (for better than MMMF rates)
  - Have 4 months expenses in my Emergency fund, 1 month expenses in checking, 1 month in savings/CD, 1 month in a short-term bond fund, and 1 month in I bonds (which you have held for one year and which can be used for educational expenses for your children as well)

Cash Management Plan (continued)

- Plans and Strategies (continued)
  - Since my income is volatile, I will have 6 months expenses in my Emergency fund, 1 month in checking, 1 month in a MMMF, 2 months in a short-term bond fund, and 2 months in I bonds
  - Re-evaluate my cash management holdings annually to make sure I am getting the best tax-adjusted interest rates
  - Watch requirements of high-yield savings accounts carefully so I do not lose return from additional fees
  - Use I bonds for cash management, which after 1 year, become education vehicles as well

Cash Management Plan (continued)

- Constraints
  - Laziness will keep me from good record keeping
  - Not living on a budget will make it difficult to save
  - Getting caught up in sin and the things of the world will make it difficult to save
- Accountability
  - From your Plan for Life

Review of Objectives

A. Do you understand the importance and of good cash management and how it can help you achieve your goals?

B. Do you understand the different types of financial institutions, and the need to spend the time each week on your finances?

C. Do you understand the different cash management alternatives and how to compare them?

D. Do you understand and can you create your Cash Management Plan?

Case Study #1

- Data
  - Bill and Suzy are married, both 25, and will be making a combined $96,000 upon graduation. Bill is in sales, so they consider a 4 month Emergency Fund a priority. They have two priorities:
    - 1. Ensure they are not losing too much return to inflation, and
    - 2. Since Suzy is expecting, they are would like to save for their new child's education as well.
  - Application
    - What cash management instruments would you recommend they use given their priorities, and how would you recommend they divide out their Emergency Fund?

Case Study #1 Answers

- A. What cash management instruments would you recommend they use given their priorities?
  - If their priority is return, I would recommend they keep some liquidity with their checking account, but would have a majority in savings, a short-term bond mutual fund, and possibly an I bond.
  - If their priority is education, I would recommend the I bond as it is state and federal tax free, and the returns, although volatile, are still good (1.90%)

Case Study #1 Answers

- B. How would you recommend they divide out their Emergency Fund?
  - I would do one month ($8,000) in checking, one month in an internet high-yield savings, one month in an I bond, and 1 month in a short-term bond mutual fund. This would accomplish both priorities

Case Study #2

- Data
  - Bill is in the 22% Federal and 5% state tax brackets. Suzie is an investor in the 35% Federal and 5% state tax bracket. They are each considering purchasing one of the following bonds for their investment portfolios:
    - 1. A 4.00% corporate bond (all taxable)
    - 2. A 2.75% municipal bond (federal tax-free)
    - 3. A 3.00% treasury bond (state tax-free)
- Calculations
  - Calculate the after-tax returns and ETY (for tax-advantaged securities) for each bonds for Bill and Suzie.
- Recommendations
  - Which bond should Bill and Suzy purchase and why?
- Note: After-tax, ETY, and After-inflation Returns (LT26) may be helpful in the problems following

Bill is an investor in the 22% federal marginal tax bracket and 5% state tax bracket. Suzie is an investor in the 35% Federal tax bracket and 5% state tax bracket. They are each considering purchasing one of the following bonds for their investment portfolios: 1. A 4.0% corporate bond (all taxable); 2. A 2.75% municipal bond (federal tax-free); or 3. A 3.0% treasury bond (state tax-free). Calculate the after-tax returns and ETY. Recommend a bond for purchase for both Bill and Suzy.

After-tax, ETY, and After Inflation Returns (LT26)

		Taxable? Federal	State	After tax Return	Equivalent Taxable Yield(1)	After-tax After-infl. Return
Marginal Federal Tax Rate	22.0%					
Marginal State Tax Rate	5.0%	(Blank is "Yes")				
Inflation Rate						
Corporate Bond (not a CMA)	4.00%			2.92%		2.92%
MMMF/STBF: (muni's)	2.75%	N		2.61%	3.58%	2.61%
Treasury Bills/Bonds	3.00%		N	2.34%	3.21%	2.34%

inflation minus 1.

Bill (After-tax return = taxable return * (1- tax rate))

- Corporate Bond 4.0%:
  - AT: 4.0% * (1 - (.22 + .05)) = 2.92%
  - ETY = before tax yield = 4.00%
- Municipal Bond 2.75%:
  - AT: 2.75% * (1 - .05) = 2.61%
  - ETY: 2.61 / (1- (.22+.05)) = 3.58%
- Treasury Bill 3.0%:
  - AT: 3.0% * (1 - .22) = 2.34%
  - ETY: 2.34% / (1-(.22+.05)) = 3.21%

- Recommendations:
  - The corporate bond is the best asset for Bill
    - Highest after-tax (2.92%) and ETY yields (4.0%)

Bill is an investor in the 22% federal marginal tax bracket and 5% state tax bracket. Suzie is an investor in the 3
tax bracket and 5% state tax bracket. They are each considering purchasing one of the following bonds for their
portfolios: 1. A 4.0% corporate bond (all taxable); 2. A 2.75% municipal bond (federal tax-free); or 3. A 3.0%
bond (state tax-free). Calculate the after-tax returns and ETY. Recommend a bond for purchase for both Bill

- Suzie (After-tax return = taxable return * (1- tax rate))
  - Corporate Bond 4.0%:
    - AT: 4.0% * (1 - (.35 + .05)) = 2.40%
    - ETY = before tax yield = 4.00%
  - Municipal Bond 2.75%:
    - AT: 2.75% * (1 - .05) = 2.61%
    - ETY: 2.61 / (1- (.35+.05)) = 4.35%
  - Treasury Bill 3.0%:
    - AT: 3.0% * (1 - .35) = 1.95%
    - ETY: 1.95% / (1-(.22+.05)) = 3.25%
- Recommendations:
  - The municipal bond is the best asset for Suzie
  - Highest after-tax (2.61%) and ETY yields (4.35%)

After-tax, ETY, and After Inflation Returns (LT26)

		Taxable? Federal	Taxable? State	After tax Return	Equivalent Taxable Yield (1)	After-tax After-infl. Return
Marginal Federal Tax Rate	35.0%					
Marginal State Tax Rate	5.0%					
Inflation Rate		(Blank is "Yes")				
Corporate Bond (not a CMA)	4.00%			2.40%		2.40%
MMMF/STBF: (muni's)	2.75%	N		2.61%	4.35%	2.61%
Treasury Bills/Bonds	3.00%		N	1.95%	3.25%	1.95%

inflation minus 1.

Case Study #3

- Data:
  - Your buddy Paul asks you about real returns. After showing him the correct method of calculating real returns, he wants to know what his real return is on his money market account. He shows you his brokerage statement, where he is earning a 0.5% yield. He also estimates that inflation will be 1.5% this year. Paul is in the 35% federal and 7% state marginal tax brackets.
- Calculations:
  - What is his after-tax and after-tax after-inflation return?
- Recommendations:
  - What are the implications of this result for cash management decisions?

Your buddy Paul asks you about real returns. After showing him the correct method of calculating real returns, he wants to know what his real return is on his money market account. He shows you his brokerage statement, where he is earning a 0.5% yield. He also estimates that inflation will be 1.5% this year. Paul is in the 35% federal and 7% state marginal tax brackets. What is his after-tax after-inflation return? What are the implications of this result for cash management decisions?

- Calculations:
  - AT: After-tax return = before-tax return * (1 – (federal + state marginal tax rate))
    - 0.5% * (1 – (.35 + .07)) = ?
      - 0.29%
  - After-tax Real Return = $\dfrac{(1\text{+ after-tax return})}{(1 + \text{inflation})} - 1$
  - The after tax, after-inflation return is:

    (1.0029/1.015) –1 = ?
      - -1.19%

Note: You must take out taxes first, before you take out the impact of inflation

After-tax, ETY, and After Inflation Returns (LT26.2)

		Taxable? Federal	State (Blank is "Yes")	After tax Return	Equivalent Taxable Yield (1)	After-tax After-infl. Return
Marginal Federal Tax Rate	35.0%					
Marginal State Tax Rate	7.0%					
Inflation Rate	1.5%					
All Taxable:						
Checking/Savings/MMA/Cash	0.50%			0.29%		-1.19%

Case Study #3 Answer

- Implications
  - It is very difficult to do much more than keep up with taxes and inflation with liquid assets.
  - Only the amount needed to meet immediate emergency needs and short-term goals should be here.
  - You should diversify your cash management assets as well as other assets
  - The final returns are even lower when you factor in the fact that you pay tithes on your increase, i.e. charitable giving.

Additional Help: [After Tax, ETY, and after Inflation Returns]

(LT26) may be useful

Teaching Tool 26 - After Tax, ETY, and After Inflation Returns
Personal Finance: Another Perspective

Special thanks to Jacob Sybrosky who put together the idea for this spreadsheet. If the financial asset is state or federal tax-fre in the Taxable column and the spreadsheet will calculate after-tax returns. Notice that the inflation rate you input should be the inflation for the period for the asset you are analyzing. For the purposes of this Teaching Tool, I calculated the Tax Equivalent Yield only for tax-advantaged assets. If the assets are taxable assets, the TEY and the input yield are the same.

Marginal Federal Tax Rate	35.0%
Marginal State Tax Rate	7.0%

Expected Inflatio	1.5%

		Taxable? Federal	State (Blank is "Yes")	After-tax Return	After-tax After-infl. Return	Tax Equivalen Yield (1)	After-infl. TEY (2)
Cash on hand:	0.00%			0.00%	-1.48%		
Traditional checking:	0.00%			0.00%	-1.48%		
Interest bearing checking:	0.50%			0.29%	-1.19%		
Savings	1.25%			0.73%	-0.76%		
Money Market Account	0.30%			0.17%	-1.31%		
Money Market mutual fund	1.50%			0.87%	-0.62%		
MM mutual funds (muni fro	1.25%	N	N	1.25%	-0.25%	2.16%	0.65%
MM mutual funds (muni fro	1.25%	N		1.16%	-0.33%	2.00%	0.50%
CD's 1 mo.	0.15%			0.09%	-1.39%		
CD's 5 yr.	1.40%			0.81%	-0.68%		
Corporate Bonds	3.50%			2.03%	0.52%		
Municipal Bonds (from anot	2.75%	N		2.56%	1.04%	4.41%	2.87%
Municipal Bonds (from you	2.75%	N	N	2.75%	1.23%	4.74%	3.19%
I Bonds (used for education)	1.96%	N	N	1.96%	0.45%	3.38%	1.85%
I Bonds (not used for educat	1.96%		N	1.27%	-0.22%	2.20%	0.69%

Case Study #4

- Data
  - Natalie heard you have taken Personal Finance at BYU. She just got married two months ago, and they were given $3,000 as a wedding present. Natalie and Taylor will both be graduating in two years. She wants either a. Save the money for law school tuition when she graduates or b. Use it to go on a vacation before law school. They are in the 22% federal and 5% state tax bracket.
- Calculations
  - If they invest the $3,000 in a U.S. Series I bond that earns 2.52%, what is her after-tax return and ETY for each decision.

Natalie and Taylor are in the 22% federal and 5% state tax bracket. They have a $3,000 wedding gift that they will either invest for school tuition or for a vacation. Calculations: If they invest the $3,000 in a U.S. Series I bond that earns 2.52%, what is the after tax and equivalent taxable yield (ETY) where the principle and interest are: A. Planned to be used to pay for law school tuition? or B. Planned to be used to save for a family vacation?

- Calculations:
  - A. AT: If Natalie and Taylor use the principle and interest for tuition, the bond is both federal and state tax exempt. The formula is:
    - Return $_{\text{after tax}}$ = return $_{\text{before tax}}$ * (1 – tax rate) or:
    - 2.52%
  - ETY: Since this asset is federal and state tax-free, the equivalent yield on a taxable bond would be the tax-free return divided by 1 minus the tax rate or
    - 2.52% /(1 – (.22 + .05)) = 2.52% / .73 =
    - 3.45%

Natalie and Taylor are in the 22% federal and 5% state tax bracket. They have a \$3,000 wedding gift that they will either invest for school tuition or for a vacation. Calculations: If they invest the \$3,000 in a U.S. Series I bond that earns 2.52%, what is the equivalent taxable yield (ETY) where the principle and interest are: A. Planned to be used to pay for law school tuition? or B. Planned to be used to save for a family vacation?

- Calculations:
  - B. AT: If Natalie and Taylor use the principle a interest for a family vacation, it is only state tax free. The after-tax rate is:
    - After-tax rate = 2.52% * (1 - .22)
    - 1.97%
  - ETY: The Equivalent Taxable Yield is
    - ETY = 1.97% / (1 – (.22 + .07))
    - 2.69%
- Implications:
  - How they choose to spend the money can have significant impact on their returns

After-tax, ETY, and After Inflation Returns (LT26)

Marginal Federal Tax Rate	22.0%				
Marginal State Tax Rate	5.0%				
Inflation Rate					
		Taxable? Federal	State (Blank is "Yes")	After tax Return	Equivalent Taxable Yield (1)
I/EE Bonds (used for education)	2.52%	N	N	2.52%	3.45%
I/EE Bonds (not used for education)	2.52%		N	1.97%	2.69%

Suggestions from Students

- To get better rates:
  - The Wall Street Journal under "Consumer Rates" has selected rates in various consumer categories. Sometimes this is an internet bank or S&L with a high interest rate. These may be interesting
    - Be aware of the conditions and requirements for these rates as they may be onerous
    - These may require a minimum balance
  - Do a Google search on highest savings rates. Go down below the Ads, and it may give a few ideas
  - Bankrate.com, nerdwallet.com and many others can give ideas of places to look for higher rates
  - http://www.bankrate.com/brm/graphs/graph_trend.asp?