

The Accelerating Evolution of Financial Markets

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Financial Innovation

A new financial product or process that arises to exploit a profit opportunity. Financial innovation occurs because financial markets are not...

- 1) Perfect (e.g., costless asymmetric information, no transactions costs)
- 2) Complete (financial instruments exist that fulfill all investors desired characteristics)

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Financial Innovation

In *steady-state* equilibrium there would be no financial innovation.

What are the catalysts for change?

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Catalysts for Change

- 1) Tax law changes
- 2) Technological advances
- 3) Changes in the level and volatility of inflation, interest rates, and exchange rates
- 4) Changes in economic activity
- 5) Regulatory change

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James C. Van Horne, *Financial Market Rates and Flows*. Prentice-Hall (1975-2001)

1975

The financial markets, particularly for short-term lending and mortgages, were still largely dominated by banks and savings and loans. Then...

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Rising and increased volatility of inflation and interest rates

“May Day” deregulation of retail brokerage commissions

Transformation of mortgage markets

Financial futures contracts:
currencies, T-bonds, and stock indexes

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The Money Market

Market for overnight lending and liquid direct financing of working capital grew.
Banks turned toward fee income.

Then...

Rising interest rates (inflation)

VS

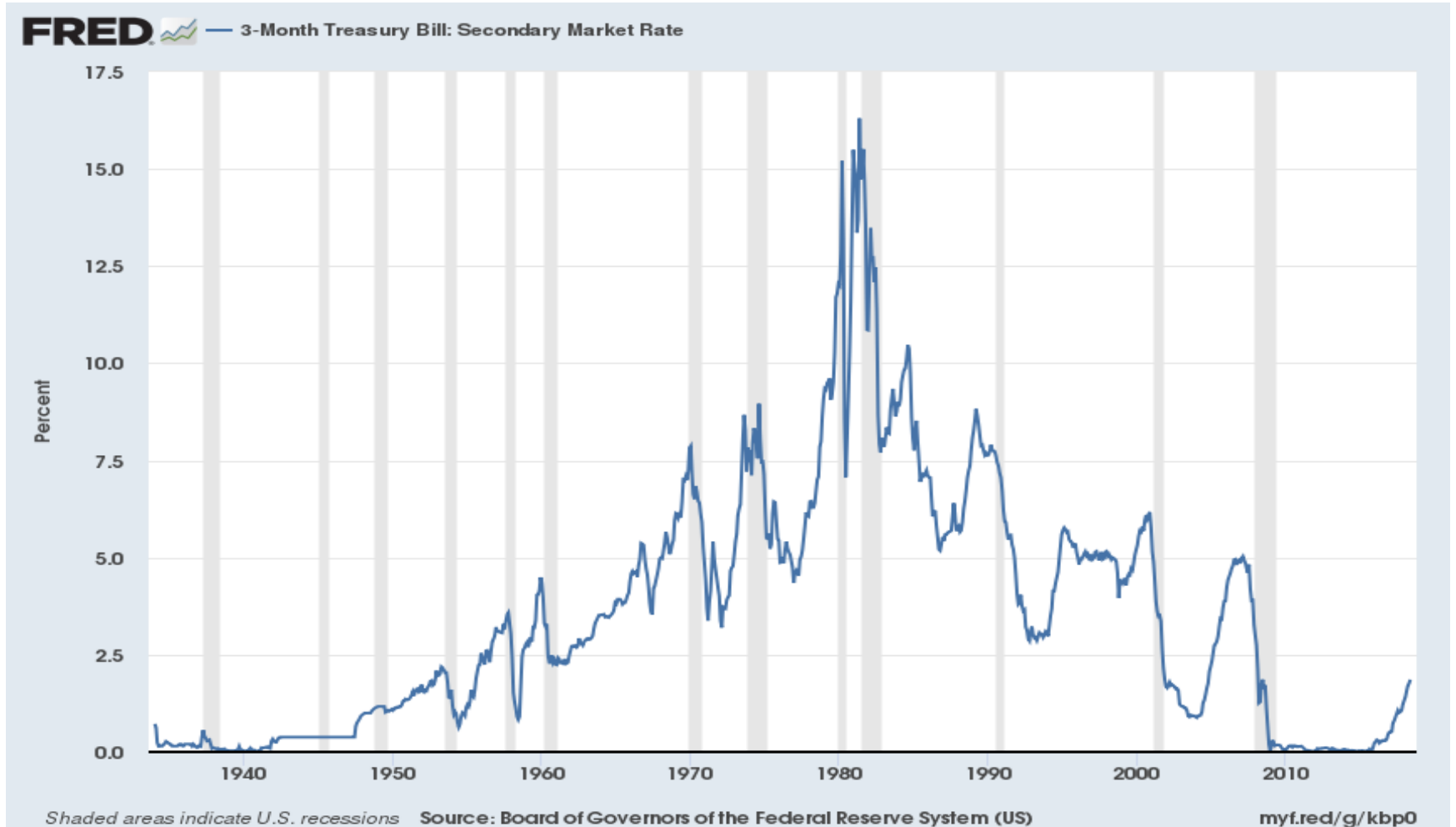
Reg Q Deposit Rate Ceilings

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U.S. 3-Month Treasury Bill Yield 1934-2018



Disintermediation!

Deposits flow toward T-Bills!

Response: Raise minimum denomination of T-Bill to \$10,000

Resulting Innovation:

Money Market Mutual Fund

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F.121 Money Market Mutual Funds (1)

Billions of dollars

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	
1 Net acquisition of financial assets	1.3	-0.0	0.2	6.9	34.4	31.2	109.9	33.6	-40.5	52.7	1
2 Foreign deposits	0.0	0.0	0.0	0.5	4.6	1.7	12.1	4.9	-1.8	-0.9	2
3 Checkable deposits and currency	0.0	-0.0	0.0	0.0	-0.0	0.1	-0.7	0.8	-0.6	-1.0	3
4 Time and savings deposits	0.5	-0.7	0.3	2.7	7.5	9.2	23.2	-3.3	-16.8	-0.3	4
5 Security repurchase agreements	0.1	-0.0	0.1	0.1	2.1	3.2	8.9	1.7	-3.2	9.6	5
6 Credit market instruments	0.7	0.6	-0.1	3.2	19.8	16.9	65.4	30.1	-17.9	44.5	6
7 Open market paper	-0.1	0.4	0.1	2.6	15.6	12.3	38.8	-1.3	-3.0	31.1	7
8 Treasury securities	0.8	0.2	-0.3	0.0	0.7	1.9	18.0	21.1	-19.8	2.4	8
9 Agency- and GSE-backed securities	0.0	0.0	0.0	0.6	3.4	0.7	5.6	1.6	1.4	3.5	9
10 Municipal securities	0.0	0.0	0.0	0.0	0.0	2.0	2.4	8.9	3.6	7.1	10
11 Corporate and foreign bonds	0.0	0.0	0.0	0.0	0.0	0.1	0.5	-0.3	-0.1	0.4	11
12 Miscellaneous assets	0.0	0.0	-0.1	0.5	0.4	0.1	1.0	-0.6	-0.2	0.8	12
13 Net share issues (liabilities)	1.3	-0.0	0.2	6.9	34.4	31.2	109.9	33.6	-40.5	52.7	13

(1) Open-end investment companies; excludes funding vehicles for variable annuities, which are included in the life insurance companies sector (table F.116).

Source: Board of Governors, Federal Reserve System, Flow of Funds Accounts

Mortgages

- 1975 Banks and S&L's over 70% of total mortgage lending.
- Skyrocketing inflation and interest rates forced Savings and Loans into insolvency (interest rate risk!)
- Innovation: Securitization

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MBS and CMOs

Mortgage-Backed Securities

MBS “Pass-throughs”

Collateralized Mortgage Obligations

“Tranche” the prepayment risk

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Hypothetical Sequential Pay CMO Average Life for Various Assumed Prepayment Speeds

Prepayment Speed (PSA)	Average life for				
	Collateral	Tranche A	Tranche B	Tranche C	Tranche D
50	15.11	7.48	15.98	21.02	27.24
100	11.66	4.90	10.86	15.78	24.58
165	8.76	3.48	7.49	11.19	20.27
200	7.68	3.05	6.42	9.60	18.11
300	5.63	2.32	4.64	6.81	13.36
400	4.44	1.94	3.70	5.31	10.34
500	3.68	1.69	3.12	4.38	8.35
600	3.16	1.51	2.74	3.75	6.96
700	2.78	1.38	2.47	3.30	5.95

One Size Does Not Fit All!



F.218 Home Mortgages (1)

Billions of dollars

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
1 Net borrowing	167.5	223.2	234.6	356.5	427.5	425.0	553.1	756.2	814.3	1022.2	1
2 Household sector	153.6	205.1	215.9	301.5	379.2	383.5	508.2	706.0	872.1	934.7	2
3 Nonfinancial corporate business	-0.1	1.1	0.3	1.4	2.1	2.0	2.1	0.7	1.9	4.7	3
4 Nonfinancial noncorporate business	13.9	17.0	18.4	53.7	46.2	39.5	42.8	49.5	-59.7	82.8	4
5 Net change in assets	167.5	223.2	234.6	356.5	427.5	425.0	553.1	756.2	814.3	1022.2	5
6 Household sector	-8.7	-8.9	-8.9	-4.9	7.1	7.1	6.8	6.1	6.1	6.6	6
7 Nonfinancial corporate business	1.1	-9.3	5.3	-2.7	-6.9	1.2	1.5	1.9	1.2	13.8	7
8 Nonfinancial noncorporate business	-0.8	-0.5	-0.6	2.7	-0.9	-0.2	1.2	-0.2	0.0	1.6	8
9 Federal government	-4.9	-3.0	-2.1	-0.3	-0.4	-0.7	-0.6	-0.9	-0.9	-0.5	9
10 State and local governments	3.2	2.3	3.0	-0.8	2.3	-0.6	-0.4	-2.7	3.2	7.7	10
11 U.S.-chartered depository institutions	60.5	61.8	74.9	63.4	97.2	131.1	85.5	208.1	201.9	389.9	11
12 Foreign banking offices in U.S.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
13 Banks in U.S.-affiliated areas	1.0	0.6	0.1	1.1	0.6	1.0	-0.9	1.5	2.5	3.4	13
14 Credit unions	4.0	9.1	9.9	10.4	13.8	12.8	15.7	16.3	20.9	25.7	14
15 Life insurance companies	0.3	-1.9	0.3	-0.6	0.1	-0.8	0.4	-1.1	1.7	-0.4	15
16 Private pension funds	0.7	0.6	0.8	0.1	0.7	1.1	-3.1	-1.8	-1.1	-0.2	16
17 State and local govt. retirement funds	0.5	0.6	0.6	1.5	1.0	-1.1	-0.3	0.7	-0.3	-1.9	17
18 Government-sponsored enterprises	-5.4	-6.6	-4.7	5.6	-10.4	16.1	21.7	45.6	94.2	-10.5	18
19 Agency- and GSE-backed mortgage pools	93.8	135.4	109.3	182.1	264.6	190.9	322.9	315.2	308.3	43.8	19
20 ABS issuers	10.8	21.6	38.4	68.1	31.9	31.1	79.1	81.6	123.6	390.2	20
21 Finance companies	-1.2	20.5	2.4	30.0	28.0	39.5	22.8	75.9	34.6	101.8	21
22 REITs	1.9	1.1	6.0	0.8	-1.2	-3.5	0.8	10.1	18.5	51.1	22

Source: Board of Governors, Federal Reserve System, Flow of Funds Accounts

CDOs—Tranche the Default Risk?

The “Gaussian Copula” streamlined the modeling and rating of CDO’s that contained Alt-A and Subprime Mortgages!

Inputs:

Default Probabilities/Loss Rates,
Average Correlation between Defaults,
and the price appreciation assumption.

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CDO with Credit Tranching

Tranche	Principal	Rating
X1	\$350 million	AAA
X2	\$ 20 million	AA
X3	\$ 10 million	A
X4	\$ 5 million	BBB
X5	\$ 5 million	BB
X6	\$ 5 million	B
X7	\$ 5 million	Not rated

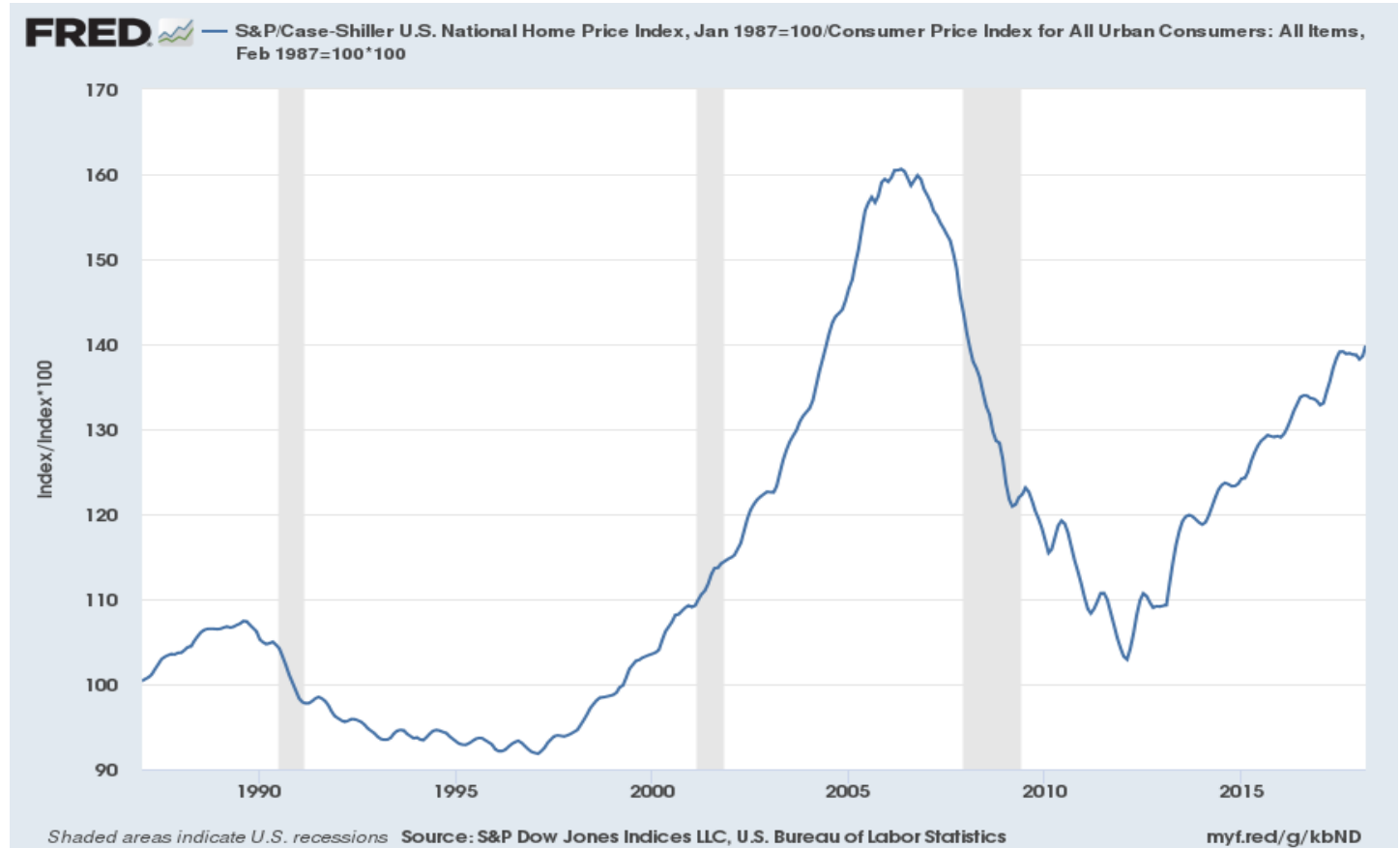
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What went wrong? GIGO!

S&P Case-Shiller U.S. Home Prices (inflation adjusted)



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Financial Futures Contracts

1972 Currency Futures

1978 Treasury Bond Futures

1982 Stock Index Futures



Financial Futures Contracts

Why do we need a futures contract on T-bonds? And why not until 1978?

—Increased interest rate volatility

Stock index futures allow portfolio managers to make large portfolio changes incurring much lower trading costs.

—Liquidity

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Exchange Traded Funds

Baskets of securities (now also derivative-based strategies) that trade on the exchange. Great idea! Why not until 1990's?

1993 SPDRs

1996 WEBS

2001 VIPERS

Technological advances in trading created the necessary new financial *processes*.



ETFs—Levered and Inverse Products

TLT iShares 20+ year Treasuries

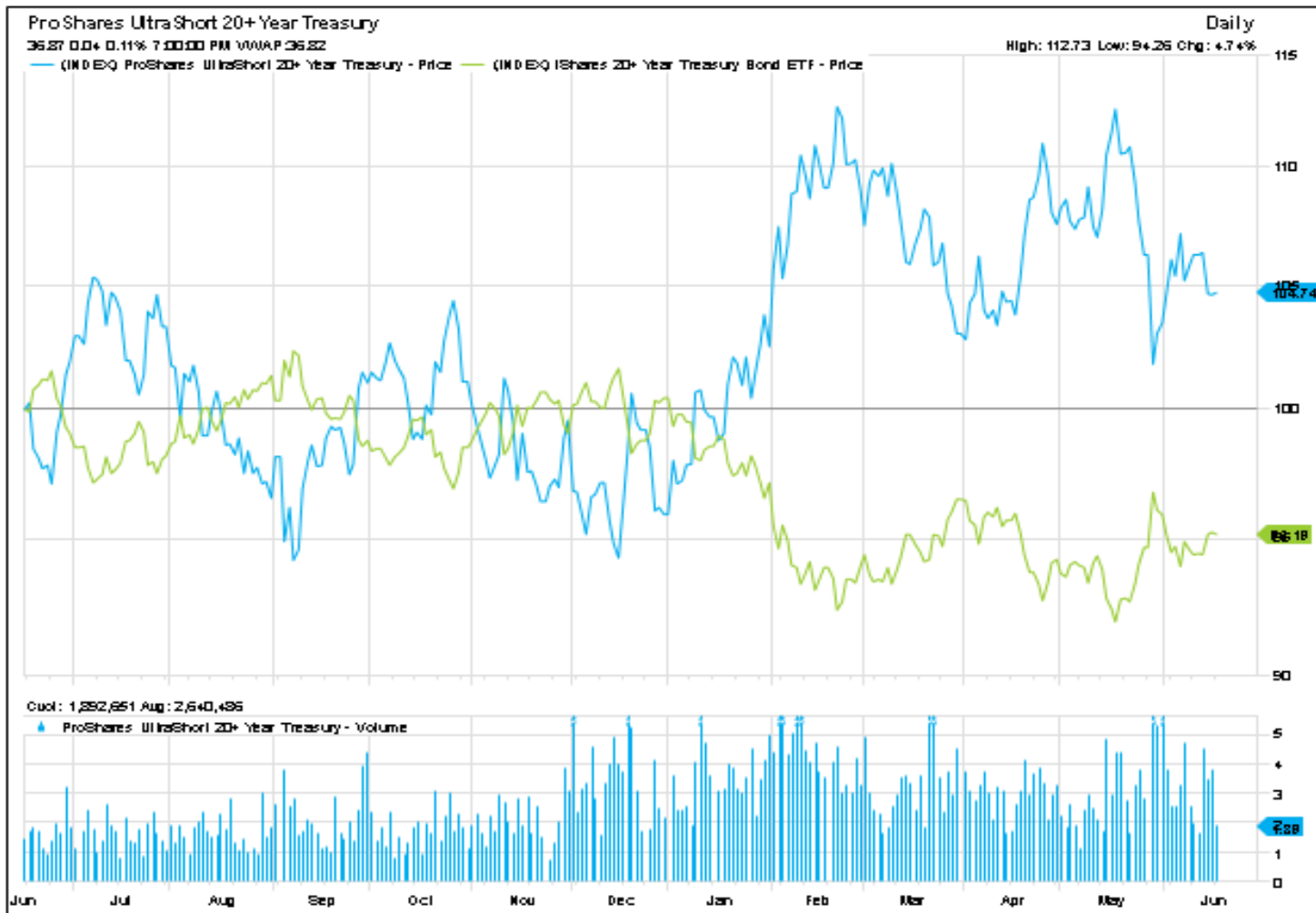
TBT ProShares Ultra-short 20+ year Treasury

TBT “seeks daily investment results, before fees and expenses, that correspond to two times the inverse (-2x) of the daily performance of the ICE U.S. Treasury 20+ Year Bond Index.”

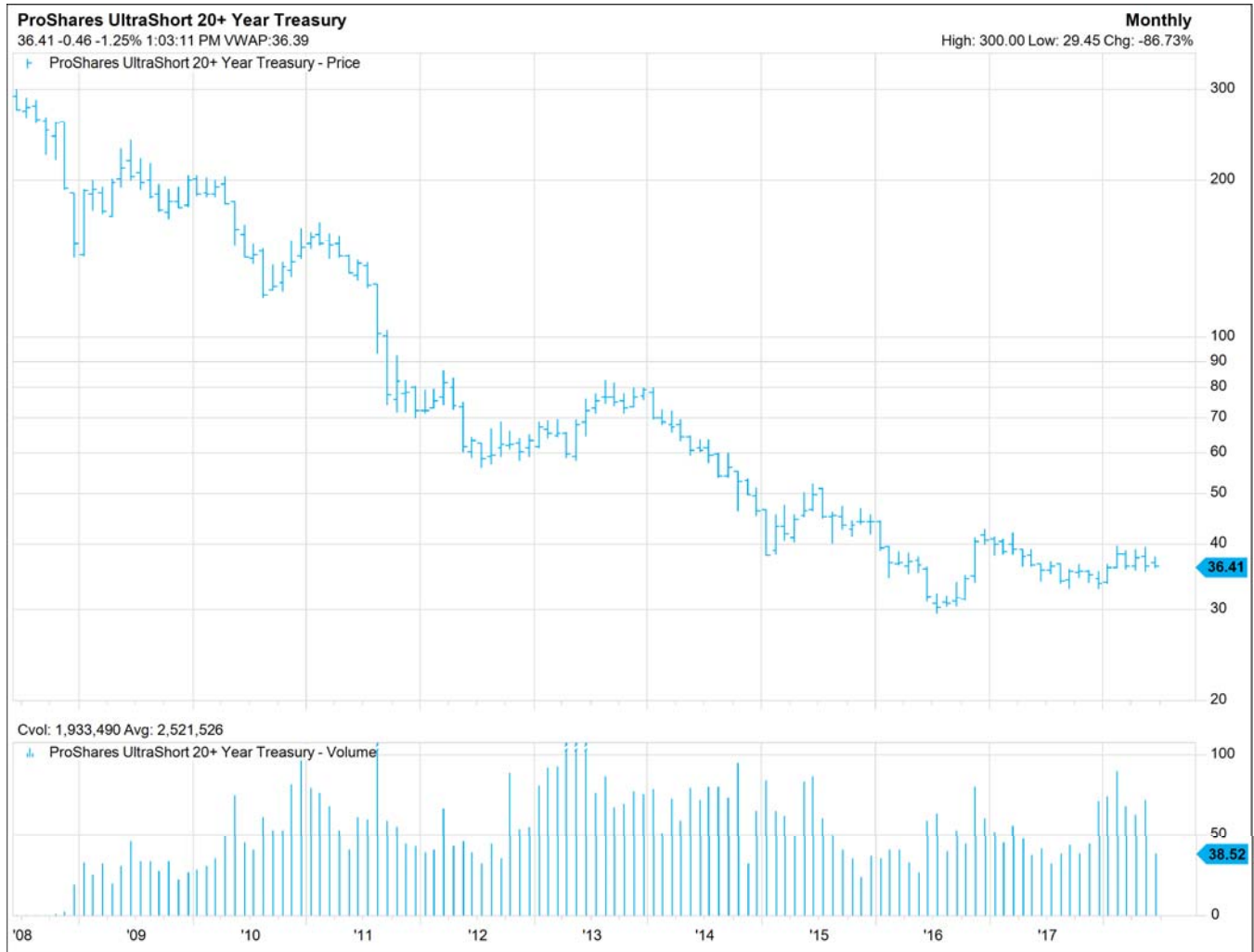
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TBT
VS
TLT
1-yr



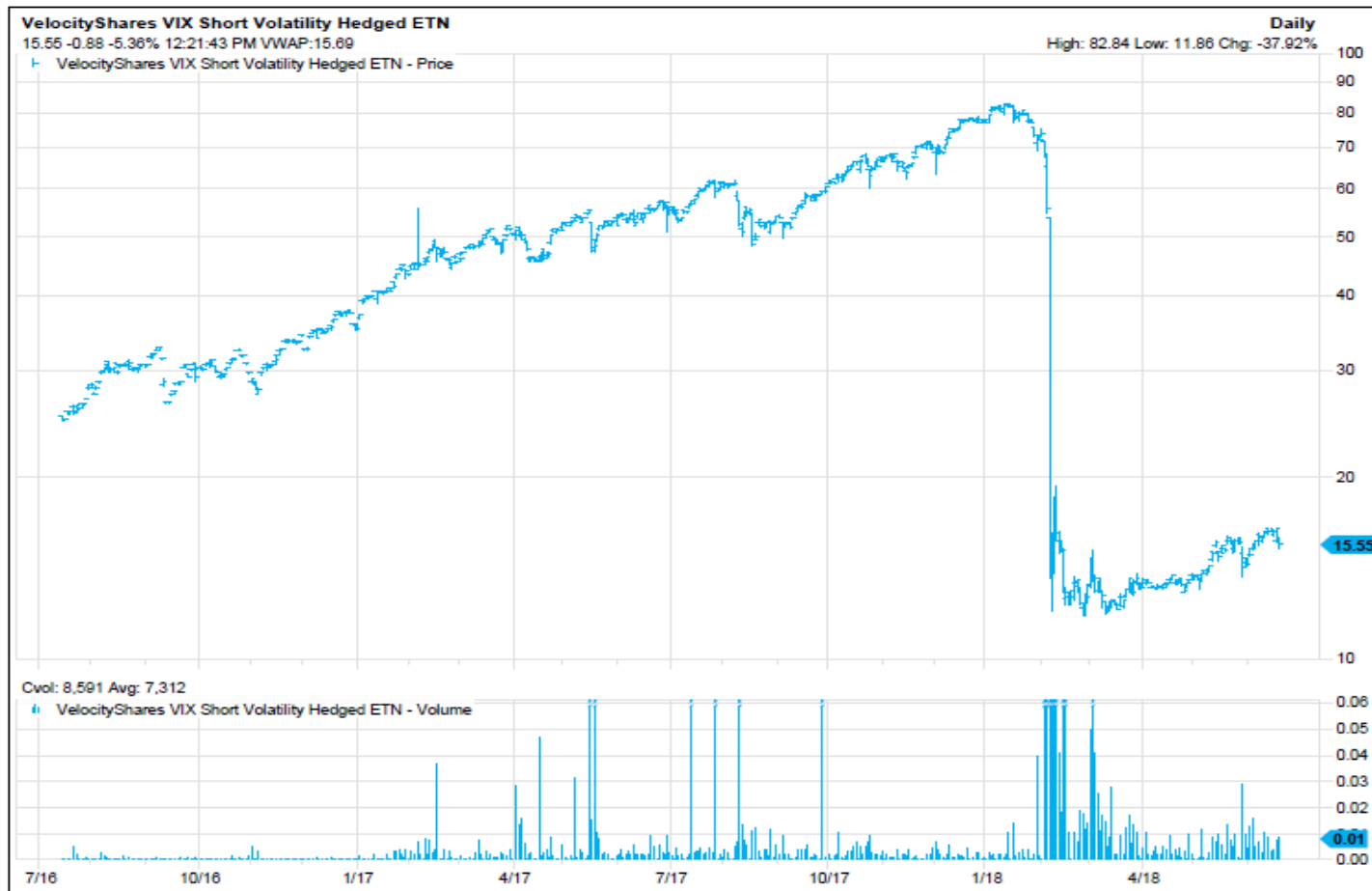
TBT since inception



The Return of Volatility



What is the VIX ?



XIVH--Short the VIX? The “low vol” trade backfires.

Blockchain and Cryptocurrency

The “distributed ledger” can allow for automatic transaction verification and “smart contracts”.

Critics say current systems ultimately more efficient and secure, otherwise adoption would be more rapid.

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Cryptocurrency

Is it money?

Definition of Money:

- 1) Generally accepted medium of exchange
- 2) Store of value (temporarily)
- 3) Serves as common unit of measure

Answer: No



Why do we hold Money?

- Transactions Demand
- Precautionary Demand
- Speculative Demand (“dry powder” not as the *tool* of speculation).

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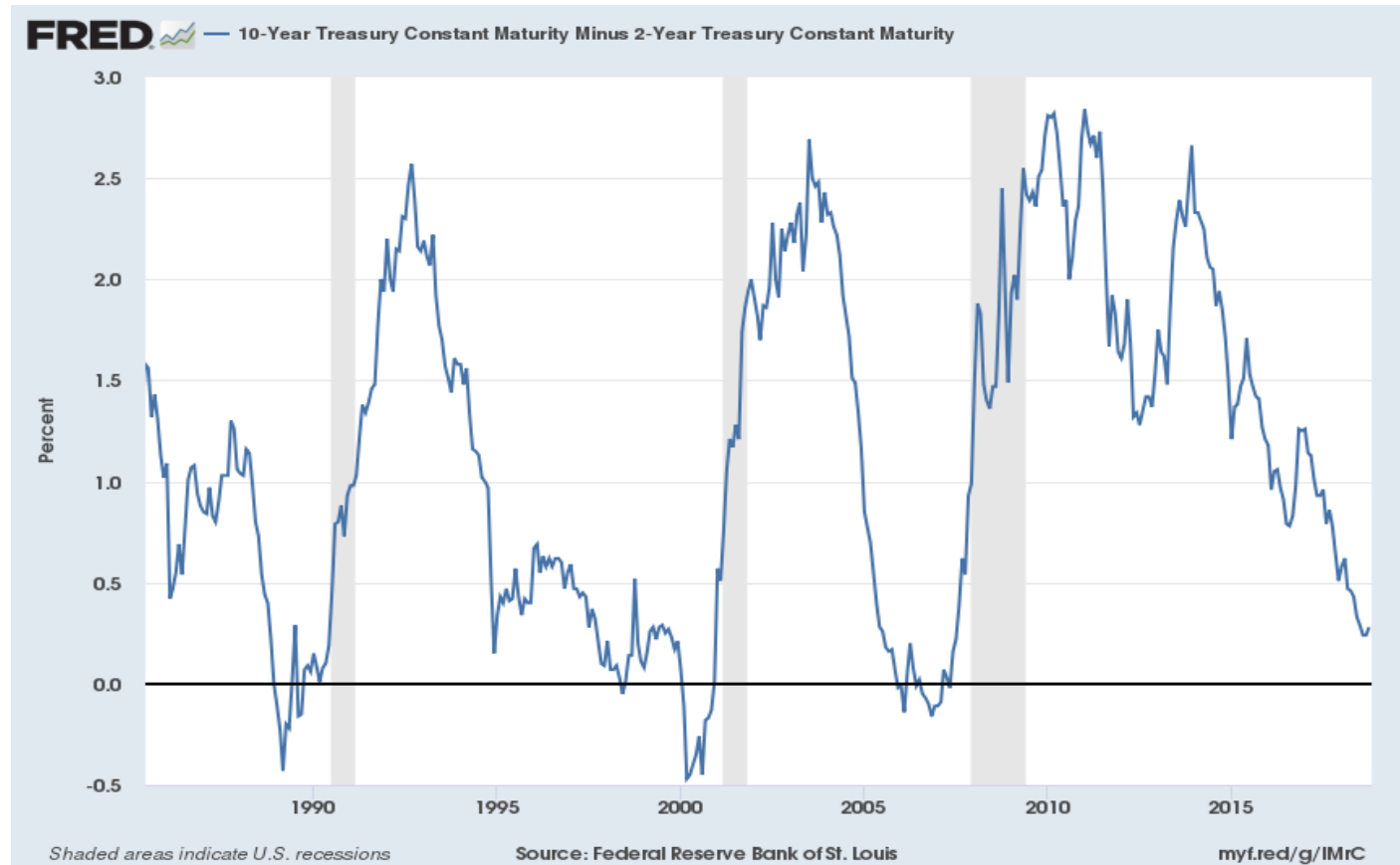
Bitcoin and other cryptocurrencies are the ideal “bubble” material!

Will the Fed Heed the Yield Curve?

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Long-term Expected Inflation



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