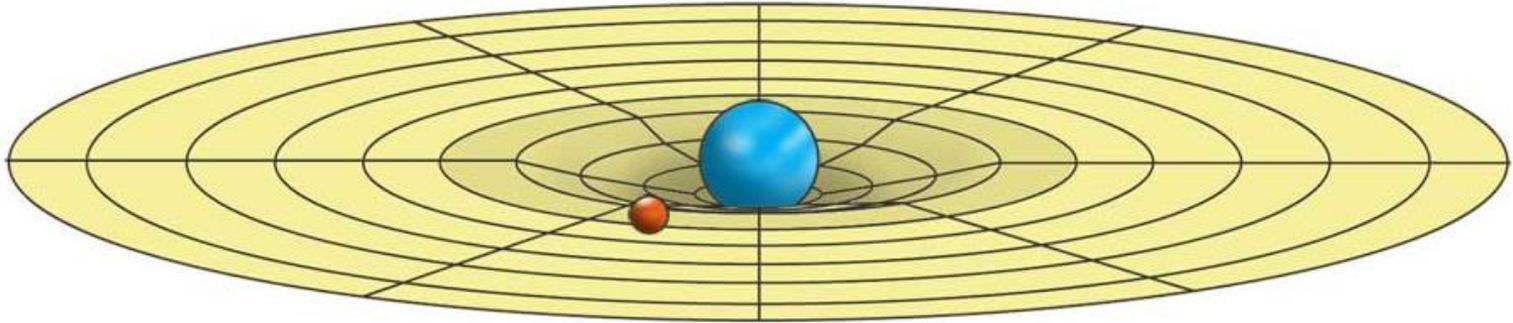




# **DYNAMICS OF YIELD GRAVITY**

***Dan Geller and Nahum Biger***



# DYNAMICS OF YIELD GRAVITY

- *Reducing risk of failure for financial institutions*

# The Banking Industry

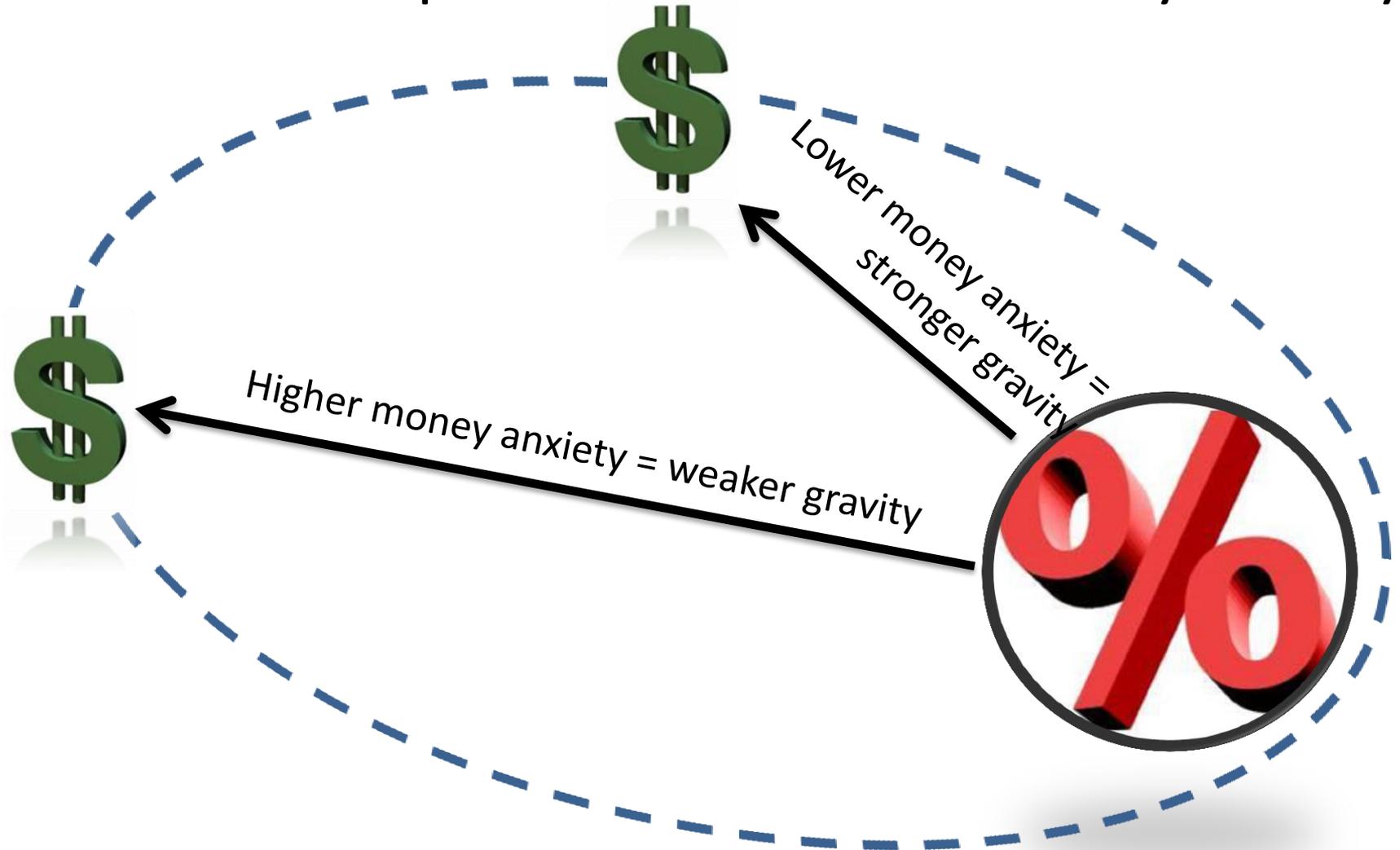
- Basel III Net Stable Funding Ratio requirements.
- Banks are required to maintain high level of term (one year and longer) deposits.
- Traditional belief: money gravitates toward high yield under equal risk.



***BASEL, Switzerland***

# Yield gravity is dynamic

It varies up to **five times** with money anxiety.





# The Banking Industry



- The recession of December 2007 – June 2009.
- In the USA trillions of dollars **gravitated toward liquid accounts.**
- This – despite the higher yield offered on term accounts.
- What might have been the explanation of this phenomenon?



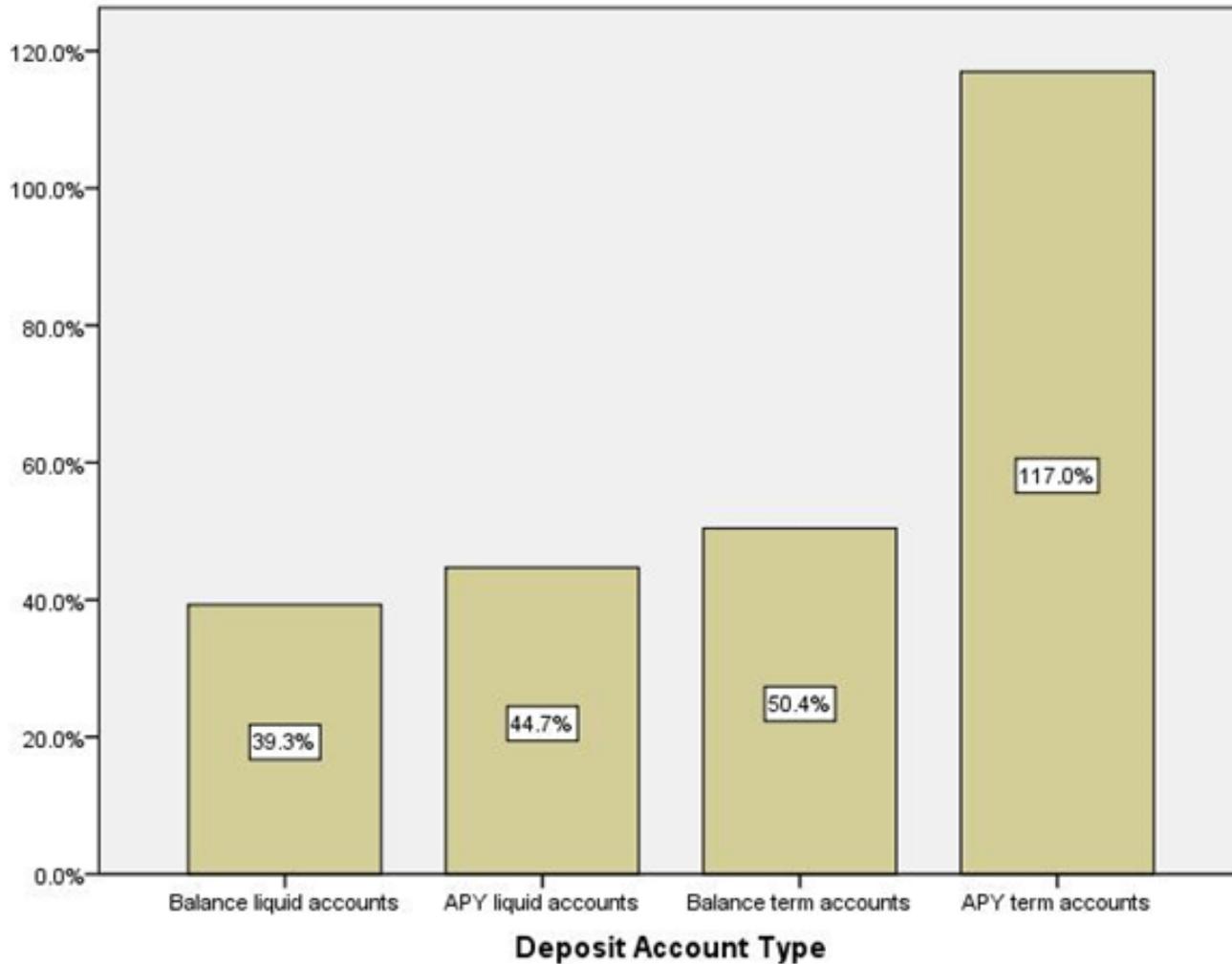


# The past growth period

- During the period prior to the great recession (2003 – 2007) there were rises in yields on both term and liquid balances. The balance of term deposits rose much faster than the balance of liquid deposits in the US banking system.
- Was that phenomenon related to the changes in yields on these two different accounts?
- Here's a summary of the change in yields and balances during the five years prior to the recession.

**The previous period:**

**Percentage change in total balances and average APY**  
**2003-2007**





# The growth period

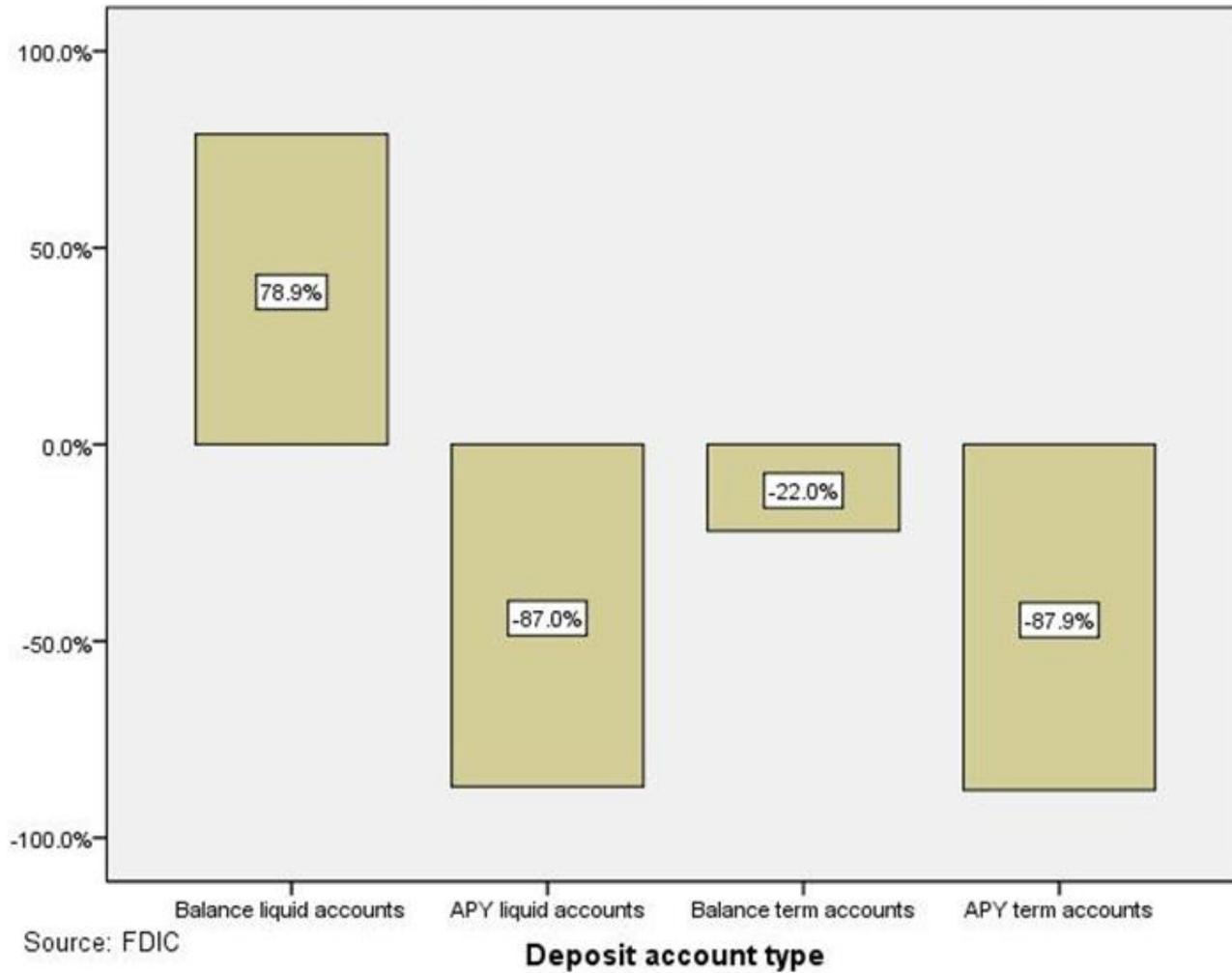
- Substantial rise in APY on term deposits and more moderate rise in APY on liquid accounts, accompanied by 50.4% rise in term deposits and less than 40% rise in liquid balances of the entire US banking system.
- Implications: yields offered by the banking system affects the preference of depositors in regard to term versus liquid accounts.
- ***Is this indeed the case???***



# The recession period

- During the recession period 2008 – 2012 we saw a substantial decline in interest rates on both term and liquid accounts.
- The APY on term deposits declined by 87.9% and the APY on liquid accounts declined by a similar proportion of 87%.
- In line with these changes, **the balance of term accounts in the US banking system fell by 22%.**
- **At variance, the balance in liquid accounts rose by 79%.**

## Percentage change in total balances and average APY 2008-2012

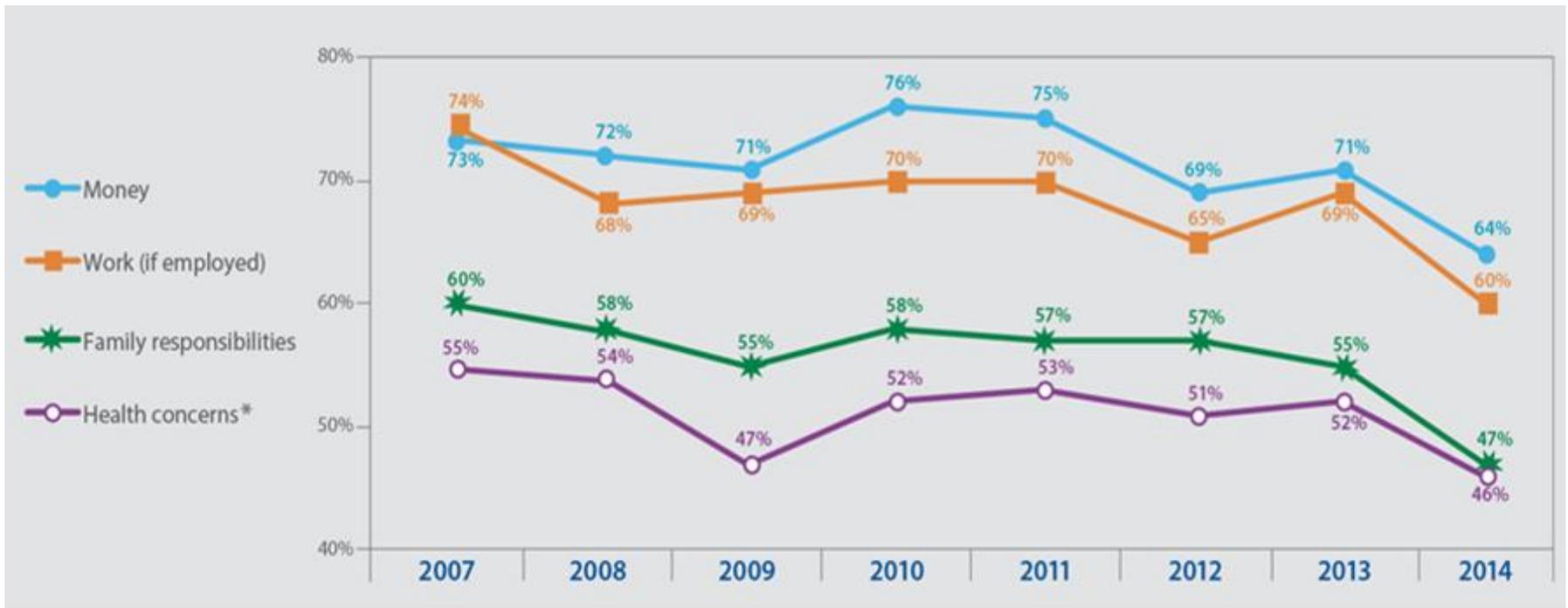


# ANXIETY



- Stress in America survey (2015): ***anxiety over money*** topped the chart of sources of stress.

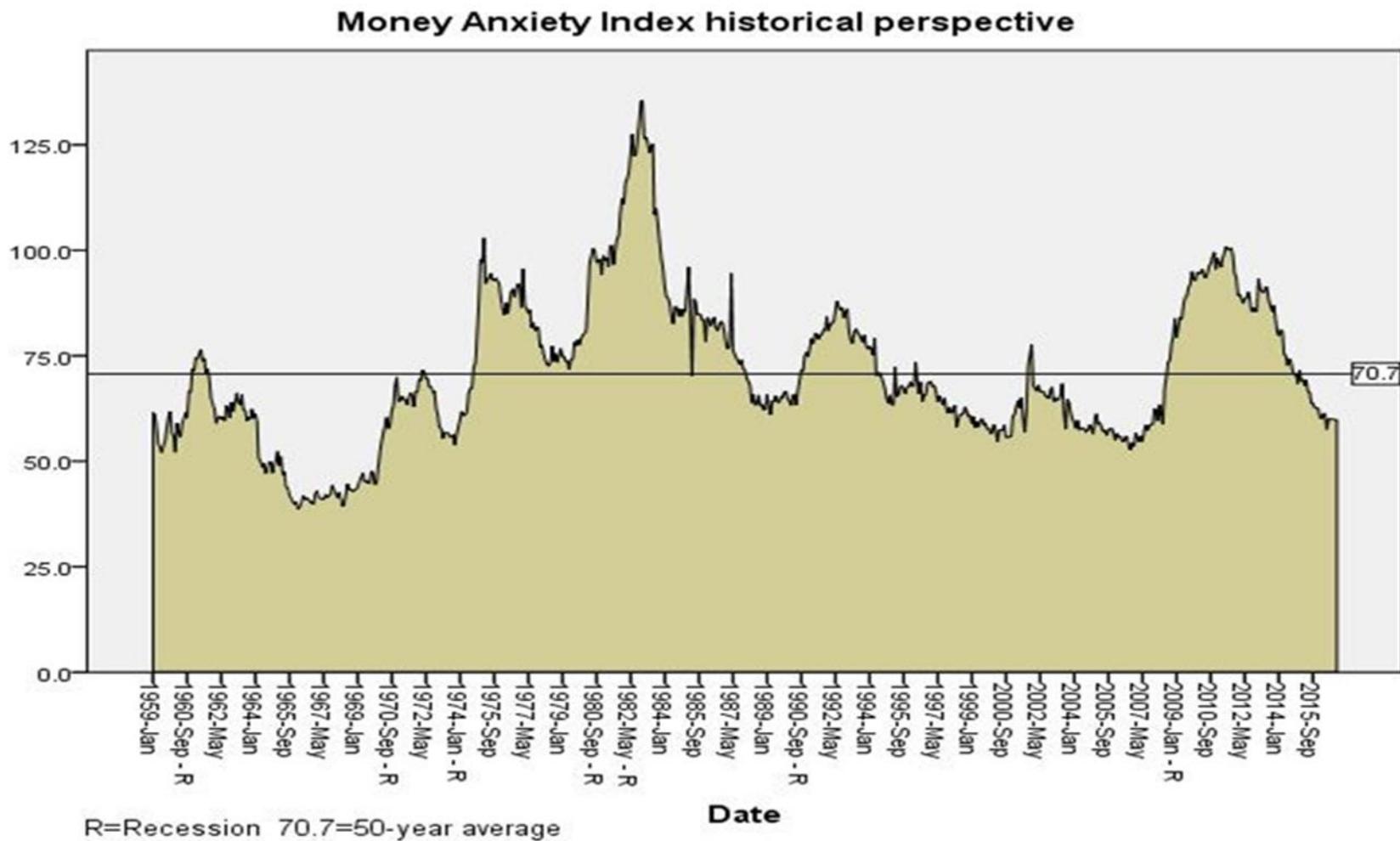
***Source: (American Psychological Association)***



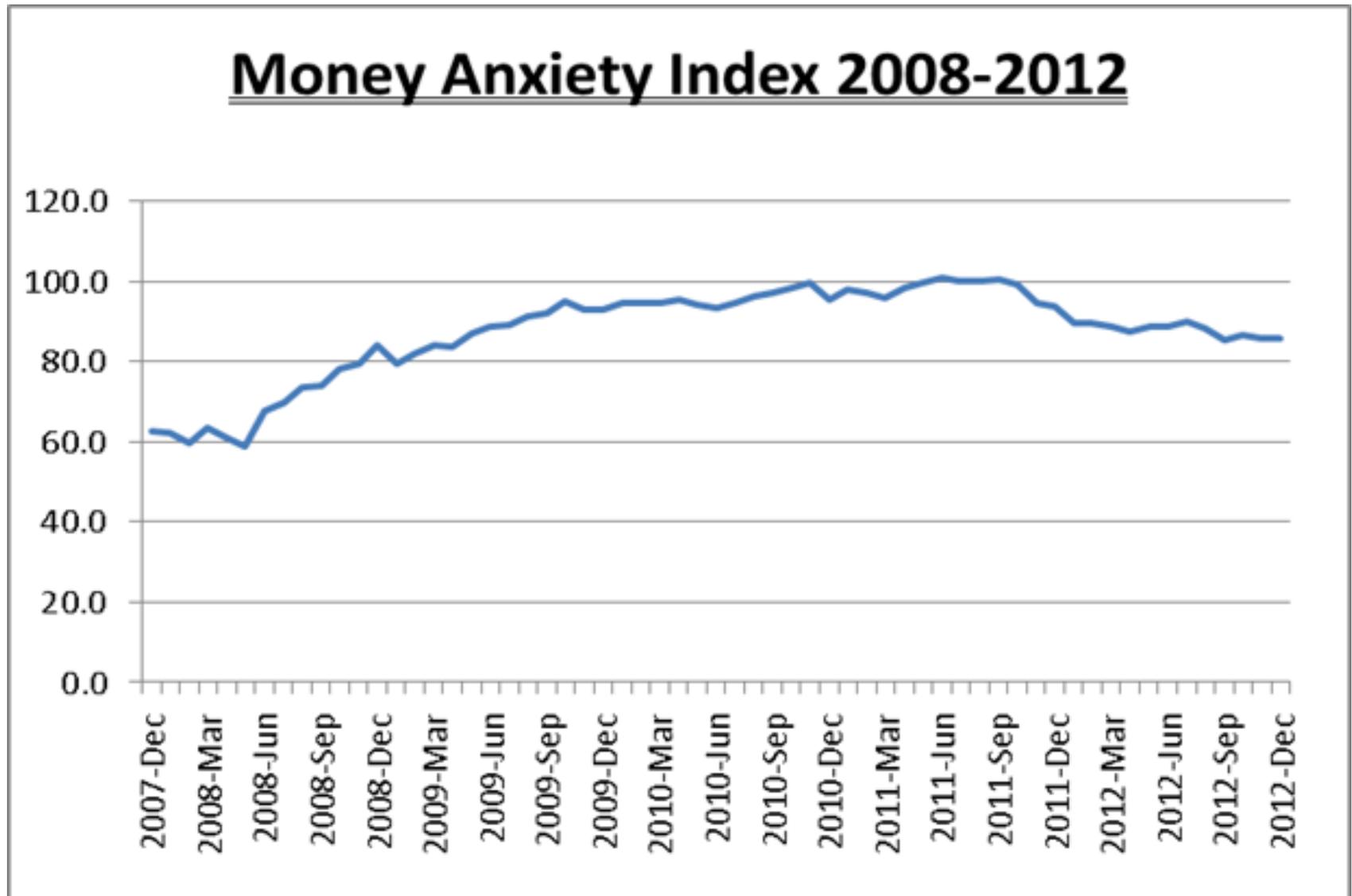
# Money Anxiety

- <http://moneyanxietyindex.com/>
- **What is the Money Anxiety Index?**
- The Money Anxiety Index developed by Dr. Dan Geller measures various economic indicators and factors associated with consumers' level of financial worry and stress. The Money Anxiety Index functions as an **early-warning signal** to shifts in the economy, allowing financial advisors to react in time to changes in the economic cycle.
- The Money Anxiety Index is highly predictive. It predicted the arrival of the Great Recession over a year prior to the official declaration of the recession in December of 2007.

## Here is how the Money Anxiety Index (MAI) behaved since 1959.



**And for the period under consideration:**



# Examination of the appropriateness of the MAI

## Money Anxiety Index goodness of fit

Model	CMIN	NFI	IFI	CFI	PCLOSE
Default model	48.982	0.96	0.961	0.961	0
Saturated model	0	1	1	1	
Independence model	1235.074	0	0	0	0

**CMIN** (Model chi-square) - The chi-square value should not be significant if there is a good model fit.

**NFI** (normed fit index) - Normed varies from 0 to 1, with 1= perfect fit.

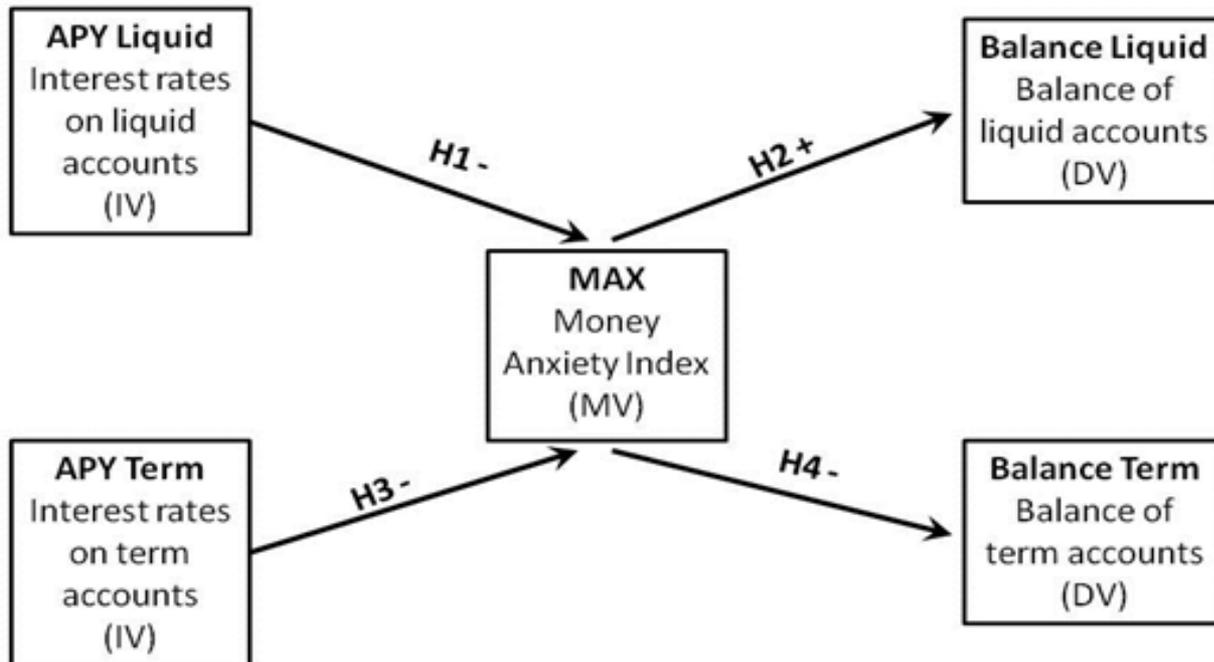
**IFI** (incremental fit index) - Should be equal to or greater than .90 to accept the model.

**CFI** (comparative fit index) - Compares the existing model fit with a null model which assumes the indicator variables in the model are uncorrelated. CFI close to 1 indicates a good fit.

**PCLOSE** (P-Value for Test of Close Fit) - tests the null hypothesis that RMSEA is no greater than .05.

We hypothesize that Money Anxiety mediates between interest rates and balances in liquid and term account balances:

## Hypothesis Modeling



# Some results of the statistical analysis

*Negative*

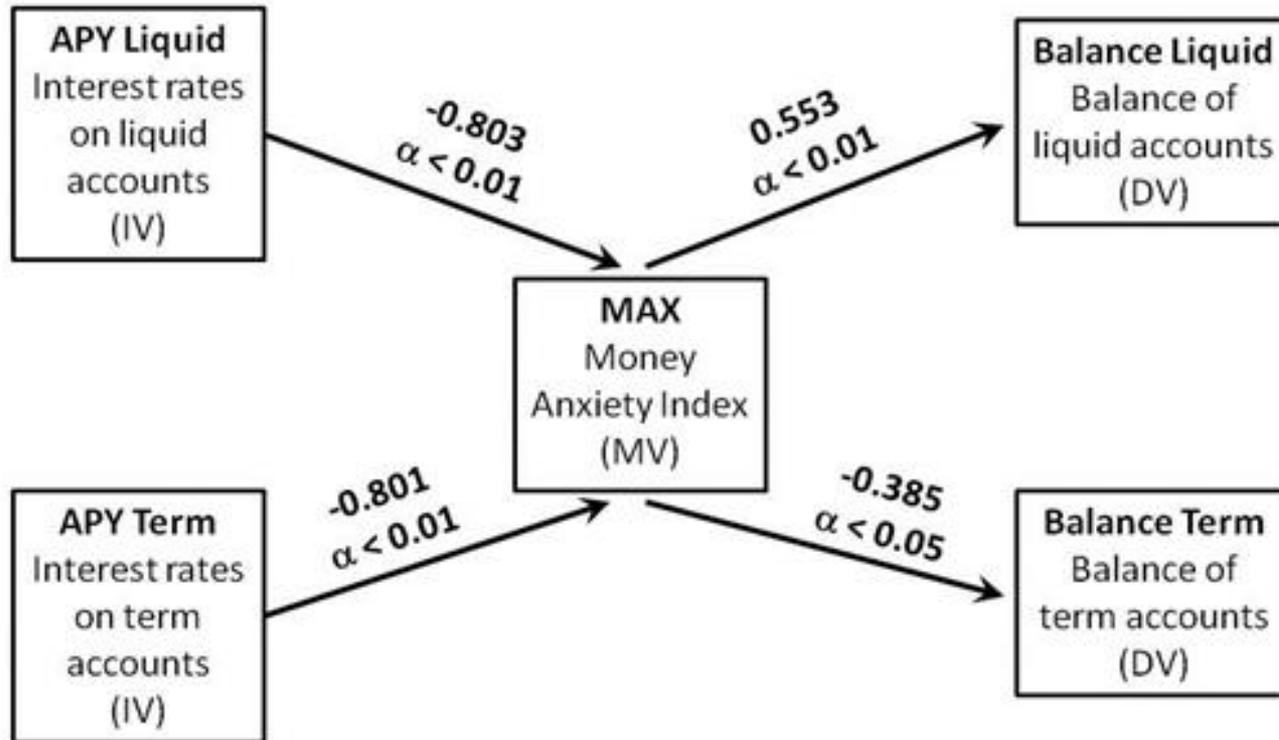
**Positive**

**Table 3 - Pearson Correlation Coefficients 2008- 2012**

		Balance liquid accounts	APY liquid accounts	Balance term accounts	APY term accounts
Money Anxiety Index	Pearson Correlation	.553	-.803	-.385	-.801
	Sig. (2-tailed)	.000	.000	.002	.000
Balance liquid accounts	Pearson Correlation		-.896	-.840	-.888
	Sig. (2-tailed)		.000	.000	.000
APY liquid accounts	Pearson Correlation			.656	.997
	Sig. (2-tailed)			.000	.000
Balance term accounts	Pearson Correlation				.661
	Sig. (2-tailed)				.000

The correlation coefficients that support the hypotheses:

## Hypotheses Correlation Coefficients



# Mediation Tests

- Statistical tests were performed in order to examine the extent to which Money Anxiety Index mediates the relationship between interest rates (APY) and balances.
- All tests showed statistical significance.
- An additional indirect test of the explanatory power of the MAI examined the relationship between this index and the ratio of liquid to term balances. The regression results are:

**Regression results: balance ratio (dependent) and MAI (independent)**

<b>SUMMARY OUTPUT</b>					
<b>Dependent: Balance Liquid / Balance Term</b>					
<b><i>Regression Statistics</i></b>					
Multiple R	0.5923				
R Square	0.3508				
Adjusted R <sup>2</sup>	0.3380				
Standard Error	1.2650				
Observations	53				
<b>ANOVA</b>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig F</i>
Regression	1	44.09	44.09	27.56	0.00
Residual	51	81.61	1.60		
Total	52	125.70			
	<i>Coefficients</i>	<i>S.E</i>	<i>t Stat</i>	<i>P-value</i>	
Intercept	-1.339	1.252	-1.069	0.290	
MAI	0.074	0.014	5.249	0.000	

# Implications on term liquidity

- Diminishing yield gravity during economic slowdown ***will prevent*** financial institutions from complying with Basal III Net Stable Funding Ratio (NSFR) requirement of one-year liquidity.
- Financial institutions can't rely on yield alone to attract term liquidity during economic slowdown (high money anxiety). Product features and other non-yield incentives should be used instead.

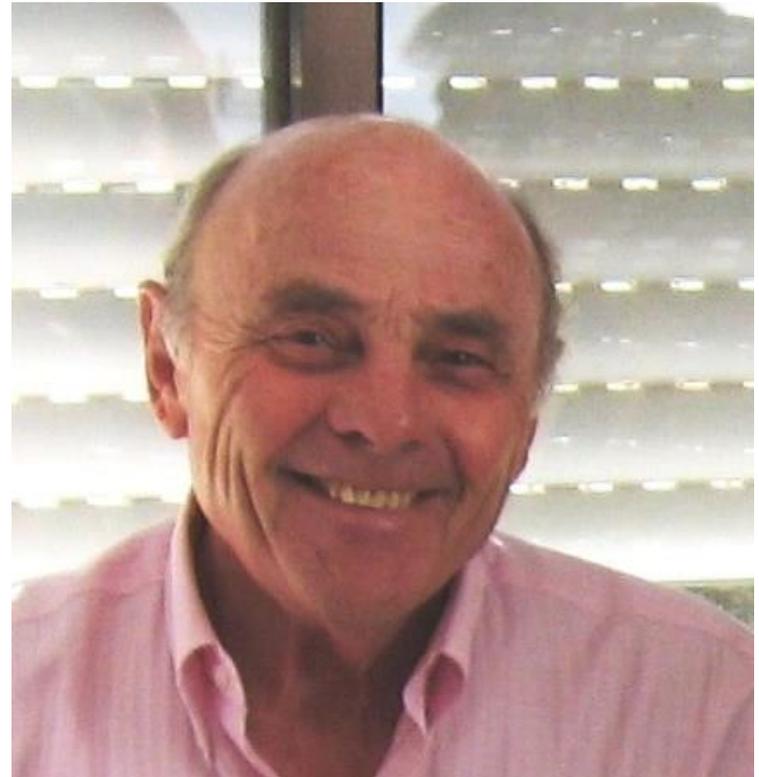
# Implications on interest expense

- Financial institutions tend to overpay for deposits during economic slowdown (high money anxiety) because they are not familiar with the diminishing gravity of yield.
- Deposit pricing models should include behavioral economics factors to ensure that interest rates are optimal for the economic environment. Otherwise, unnecessary interest expense can put financial institutions at risk of low net interest margins.

# Thank you



Dr. Dan Geller  
drgeller@analyticom.com



Professor Nahum Biger  
nbiger@univ.haifa.ac.il