

# Analytics in an Age of Chaos

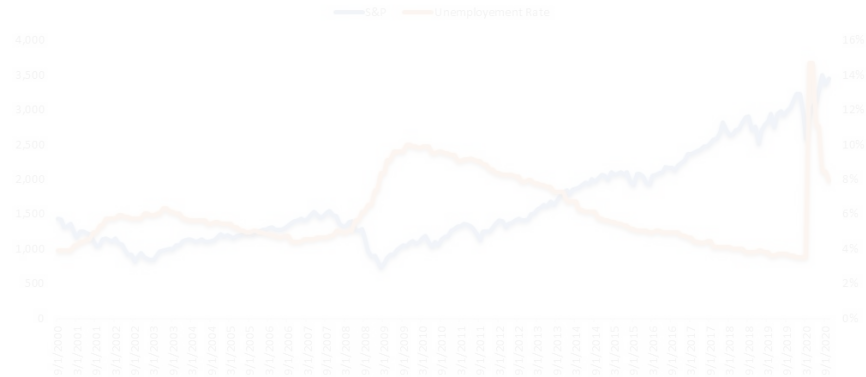
COVID-19

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(\bar{A}) = 1 - P(A)$$

$$P(A \cap B) = P(A)P(B)$$



Free Sample: How Students Slew Studies THE NORTHERNER JULY 10

Woodworking: Different Kind Of Boardroom RELATED MONEY JULY 10

Just a Game? Virtual Worlds Blur the Line WEEKEND JOURNAL JULY 10

## THE WALL STREET JOURNAL

FRIDAY, AUGUST 10, 2007 VOL. 132, NO. 32

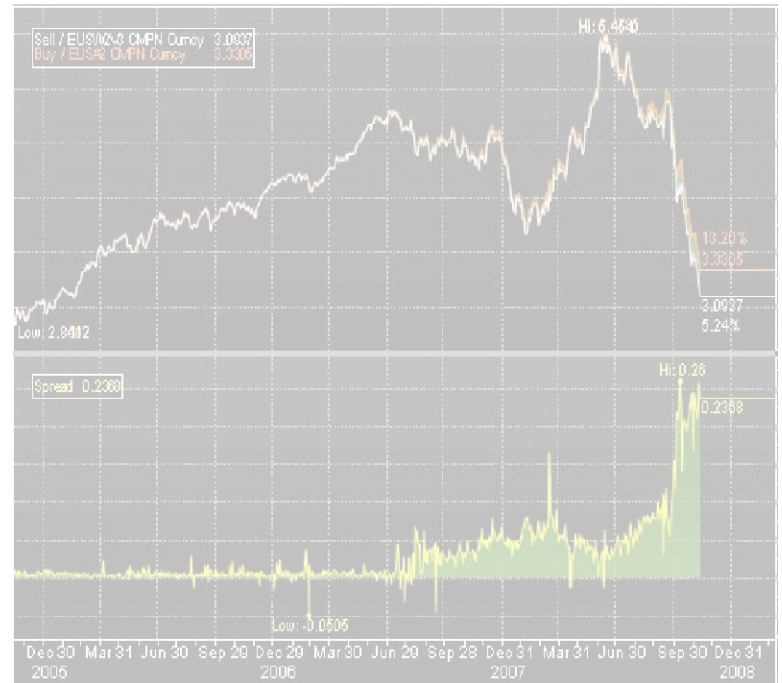
GLOBAL SCALE

### What's News

**Impact of Mortgage Crisis Spreads**  
How Subprime Mess Enamored German Banks, ICB Gets a Bailout

**Due Tumbles 2.8%**  
As Fallout Intensifies, Moves by Central Banks





September 2007  
Credit Crunch Begins

Auto Sales



# THE WALL STREET JOURNAL

MONDAY, SEPTEMBER 15, 2008 • VOL. CCLII NO. 64



## Crisis on Wall Street as Lehman Totters, Merrill Is Sold, AIG Seeks to Raise Cash

**Fed Will Expand Its Lending Arsenal in a Bid to Calm Markets; Moees Cap a Momentous Weekend for American Finance**

The American financial system was shaken to its core on Monday as Lehman Brothers Holdings Inc. filed for protection under Chapter 11 of the U.S. bankruptcy code, and Merrill Lynch & Co. agreed to be sold to Bank of America Corp. in a \$50-billion takeover. In a separate announcement, the Federal Reserve announced it would expand its lending facilities to help stabilize the financial system.

**Ultimatum By Paulson Sparked**

By Matthew Klein

The U.S. government's ultimatum to Lehman Brothers Holdings Inc. to accept a government-backed rescue package or face bankruptcy was a pivotal moment in the crisis. Treasury Secretary Hank Paulson's ultimatum to Lehman Brothers Holdings Inc. to accept a government-backed rescue package or face bankruptcy was a pivotal moment in the crisis.

# THE WALL STREET JOURNAL

WEDNESDAY, SEPTEMBER 17, 2008 • VOL. CCLII NO. 66

## U.S. to Take Over AIG in \$85 Billion Bailout; Central Banks Inject Cash as Credit Dries Up

**Emergency Loan Effectively Gives Government Control of Insurer; Historic Move Would Cap 10 Days That Reshaped U.S. Finance**

The U.S. government would take over American International Group Inc. in an \$85-billion bailout, the move effectively giving the government control of the insurer. The U.S. government's move to take over AIG was a historic moment in the crisis.

**Urgent Mission**

By Matthew Klein

The U.S. government's urgent mission to stabilize the financial system was a key focus of the crisis. The U.S. government's urgent mission to stabilize the financial system was a key focus of the crisis.



**Lending Among Banks Freezes**

By Matthew Klein

The freezing of lending among banks was a major concern during the crisis. The freezing of lending among banks was a major concern during the crisis.

# THE WALL STREET JOURNAL

TUESDAY, SEPTEMBER 16, 2008 • VOL. CCLII NO. 65

## AIG, Lehman Shock Hits World Markets

**Focus Moves to Fate of Giant Insurer After U.S. Allows Investment Bank to Fail; Barclays in Talks to Buy Core Lehman Unit**

The Dow Jones Industrial Average fell 4.4% on Monday, its largest one-day drop since the 2000 crash. The U.S. stock market saw a sharp decline as investors reacted to the news of Lehman's bankruptcy and AIG's bailout. The Dow Jones Industrial Average fell 4.4% on Monday, its largest one-day drop since the 2000 crash.



**AIG Faces Cash Crisis As Stock Dives 61%**

By Matthew Klein

AIG's cash crisis was a major focus of the crisis. AIG's cash crisis was a major focus of the crisis.

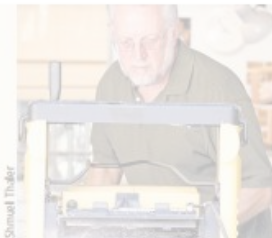
S&P 1,500  
1,400  
1,300  
1,200  
1,100  
1,000  
900  
800  
700  
600

1/2/2008 2/2/2008 3/2/2008 4/2/2008 5/2/2008 6/2/2008 7/2/2008 8/2/2008 9/2/2008 10/2/2008 11/2/2008 12/2/2008 1/2/2009 2/2/2009 3/2/2009





**Free Sample:  
How Students  
Skew Studies**  
THE NUMBERS GUY | B1



**Woodworking:  
Different Kind  
Of Boardroom**  
WEALTH REPORT | W1



**Just a Game?  
Virtual Worlds  
Blur the Line**  
WEEKEND JOURNAL | W1

# THE WALL STREET JOURNAL.

DOW JONES

FRIDAY, AUGUST 10, 2007 - VOL. CCL NO. 34

★★★★ \$1.50

DJIA 13270.68 ▼ 387.18 -2.8% NASDAQ 2556.49 ▼ 2.2% NIKKEI 17170.60 ▲ 0.8% DJ STOXX 50 3751.48 ▼ 1.9% 10-YR TREAS ▲ 14/32, yield 4.788% OIL \$71.59 ▼ \$0.56 GOLD \$661.40 ▼ \$13.10 EURO \$1.3679 YEN 118.20

## What's News—

Business and Finance

World-Wide

**F**allout from the credit crisis intensified, triggering central-bank intervention and sending the Dow industrials plunging 387.18 points to 13270.68. French bank BNP Paribas said it was freezing three funds due to subprime-related losses. The ECB and Fed injected cash into money markets to keep rates down. Several hedge funds said they were in the red and selling off assets. **A1**

■ **Global central banks** appear unlikely to cut rates, despite yesterday's aggressive response to signs of market distress. **A3**

■ **The SEC is checking** the books at Wall Street firms, including Goldman, Bear Stearns and Merrill, to make sure they aren't hiding subprime-mortgage losses. **C1**

■ **Bush addressed wide-ranging issues** at a news conference. The president dismissed bipartisan calls for an increase in the federal gasoline tax to finance repairs of the more than 70,000 "structurally deficient" U.S. bridges. He also rejected direct government aid for people who lose their houses to foreclosures and offered a defense of Gonzales, saying the attorney general had done nothing wrong. **A5**

*Romney is spending big on tomorrow's Iowa straw poll in a bid to show he is more driven and organized than other Republican presidential candidates.*

■ **The Marines Corps dismissed** charges against a lance corporal who had been accused of murdering three Iraqis after a bombing and against a captain who allegedly had failed to

### GLOBAL SCALE

## Impact of Mortgage Crisis Spreads

*How Subprime Mess Ensnared German Bank; IKB Gets a Bailout*

DÜSSELDORF, Germany—Five years ago, a little-known bank that lent to small and midsize German companies decided it wanted to broaden its business. An affiliate of the bank started buying complex bonds invented in the U.S.

The strategy brought a sharply higher industry profile for IKB Deut-

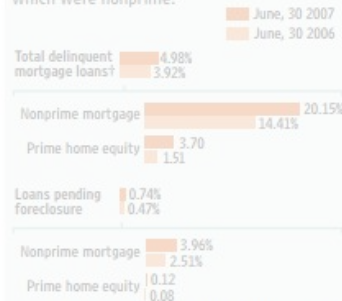
*By Carrick Mollenkamp, Edward Taylor and Ian McDonald*

sche Industriebank AG. Moody's Investors Service endorsed its move, crediting the bank last year with "successfully diversifying."

Today, IKB is on the receiving end of a bailout, organized over a weekend of emergency meetings by Germany's fi-

### Risk Factors

Yesterday, Countrywide Financial released updated delinquency and foreclosure rates for the \$1.4 trillion in mortgages that it serviced as of June 30, \$123.4 billion of which were nonprime.\*



\*Nonprime includes loans to people with weak credit records and high debt in relation to their income, as well as loans to people who don't document their income or assets.

†Payments are behind by 30 days or more  
Source: the company

*Dow Tumbles 2.8% As Fallout Intensifies; Moves by Central Banks*

Fallout from the intensifying credit crisis stretched from a French bank to the largest home-mortgage lender in the U.S., triggering unusual central-bank interventions and driving the Dow Jones Industrial Average to its second-worst drop this year.

*By Gregory Zuckerman, James R. Hagerty and David Gauthier-Villars*

The troubles demonstrated both the global reach of the crisis and its impact on a widening circle of markets and companies. The first jolt came from French bank BNP Paribas, which said early in the day that it was freezing three investment funds once worth a combined \$2.17 billion because of losses related to U.S. housing loans.





Rick Wagner, Chairman & CEO of General Motors



Steve Yzerman. The Captain.



# THE WALL STREET JOURNAL.

DOW JONES  
A News Corporation Company

TUESDAY, SEPTEMBER 30, 2008 - VOL. CCLII NO. 77

★★★★ \$2.00

DIA 10365.45 ▼ 777.68 -7.0% NASDAQ 1983.73 ▼ 9.1% NIKKEI 11743.61 ▼ 1.3% DJ STOXX 50 2588.72 ▼ 4.9% 10-YR TREAS ▲ 1 21/32, yield 3.630% OIL \$96.37 ▼ \$10.52 GOLD \$888.20 ▲ \$5.30 EURO \$1.4441 YEN 104.29

## Bailout Plan Rejected, Markets Plunge, Forcing New Scramble to Solve Crisis

BY SARAH LUECK,  
DAMIAN PALETTA  
AND GREG HITT

WASHINGTON—The House of Representatives defeated the White House's historic \$700 billion financial-rescue package—a stunning turn of events that sent the stock market into a tailspin and added to concerns that the U.S. faces a prolonged recession if the legislation isn't revived.

The Dow Jones Industrial Average sustained its biggest point drop in history and its biggest closing decline since the day the markets re-opened after the Sept. 11, 2001, terrorist attacks. The Dow, which had opened sharply lower on fears of more possible bank failures, finished the day down 7%, with a 777.68 point drop to 10365.45. Losses to shares on the broader Dow Jones Wilshire 5000 index amounted, on paper, to \$1.2 trillion—eclipsing the size of the proposed bailout package. The Nasdaq Stock Market finished down 9.1%.

The widely watched VIX index, a measure of market volatility often called “the fear index,” closed at its highest levels in its 28-year history. In early trading







**BOOSTING  
OUR ECONOMY**





The plan includes taxpayer assistance for GM and Chrysler in return for radical restructuring.

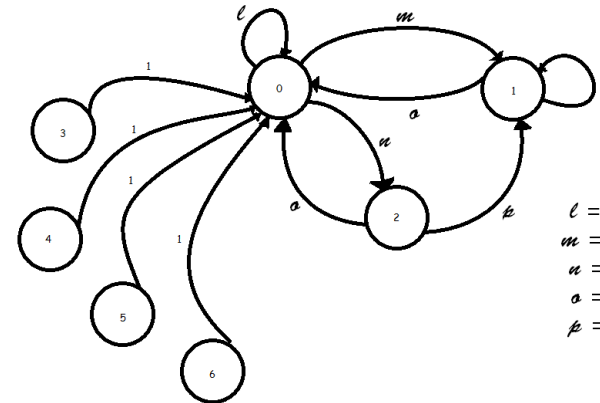
## **Bush announces \$17.4 billion auto bailout**

# PONTIAC



## SATURN

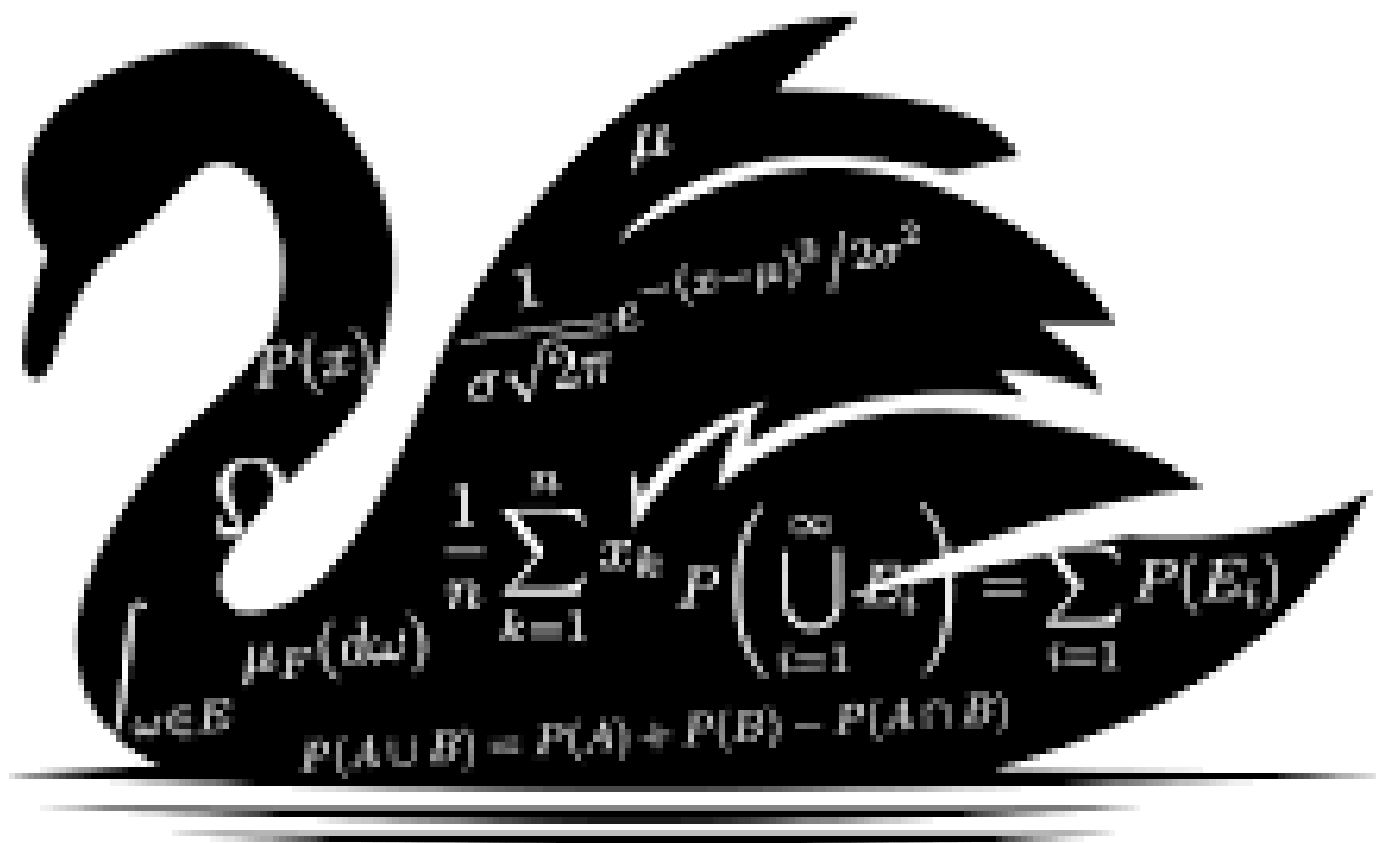
## HUMMER



$$\begin{aligned}l &= s + x + (d_4 + d_5 + d_6)(y + z) \\m &= d_3(y + z) \\n &= d_2(y + z) \\a &= s + x + (d_3 + d_4 + d_5 + d_6)(y + z) \\p &= d_2(y + z)\end{aligned}$$













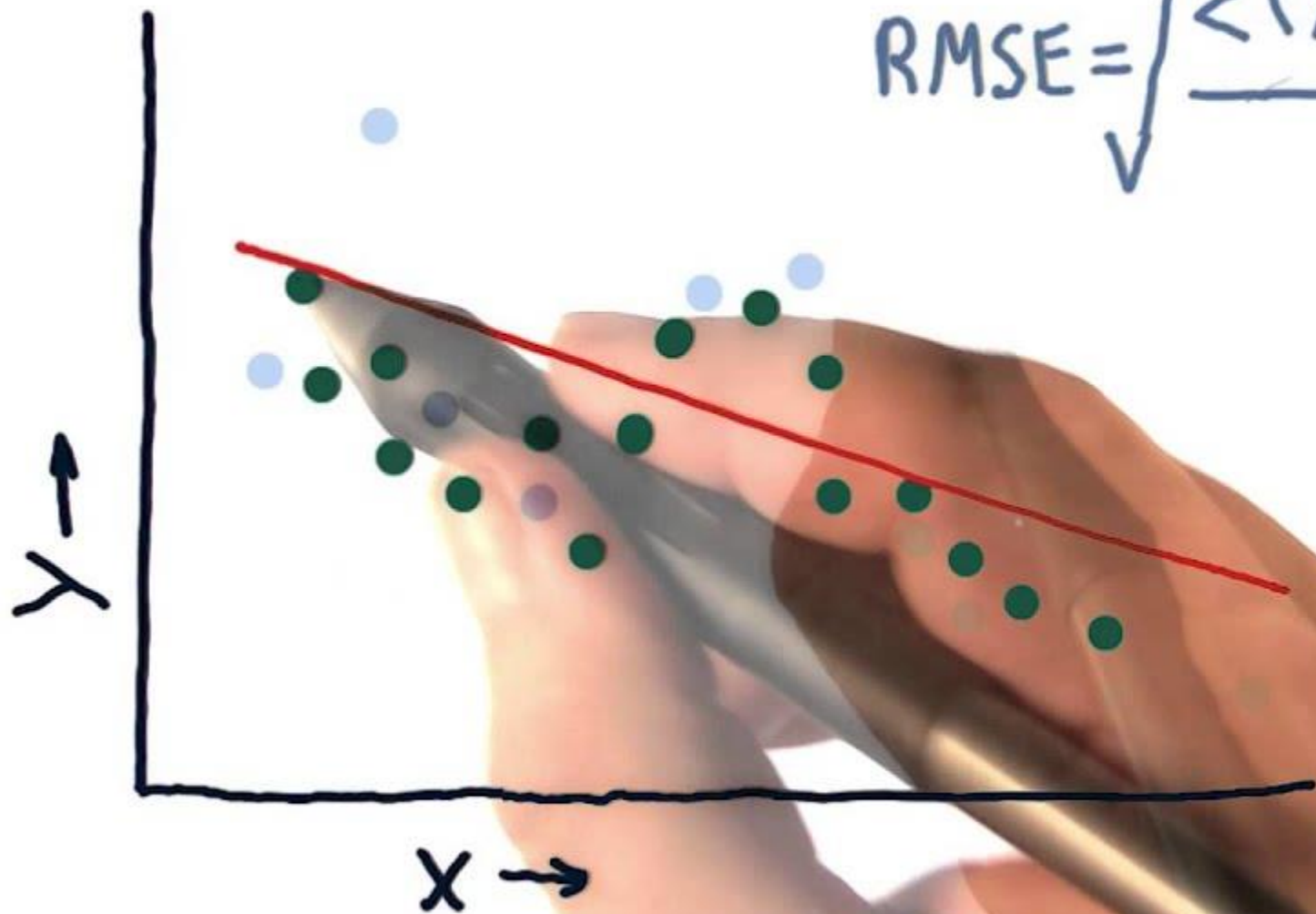


# In sample vs out of sample

Data

train

test



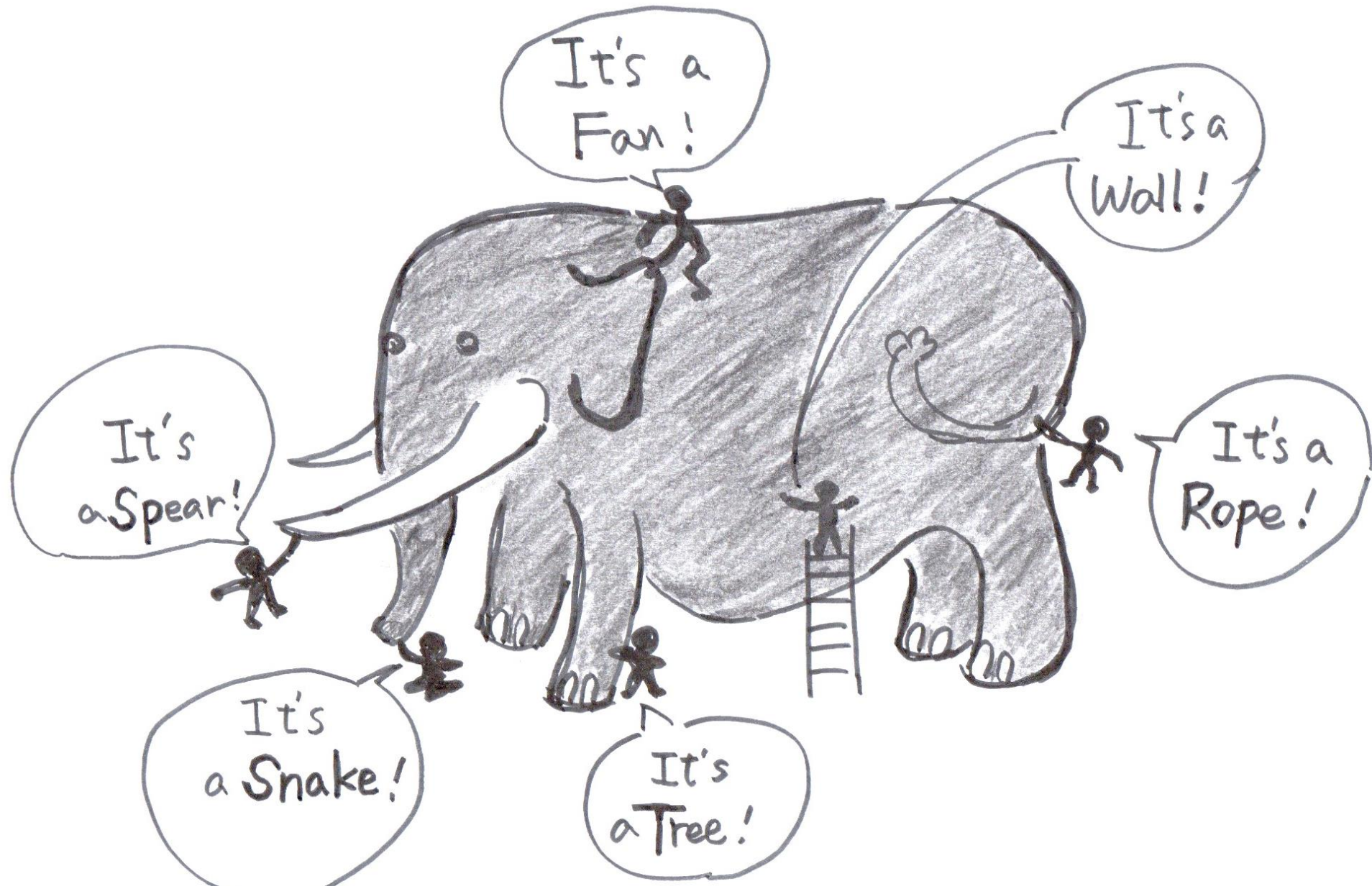
$$RMSE = \sqrt{\frac{\sum (Y_{\text{test}} - Y_{\text{predict}})^2}{N}}$$



**“Of course we can make fast decisions ...  
once we have considered the 4872 factors.”**







It's a Fan!

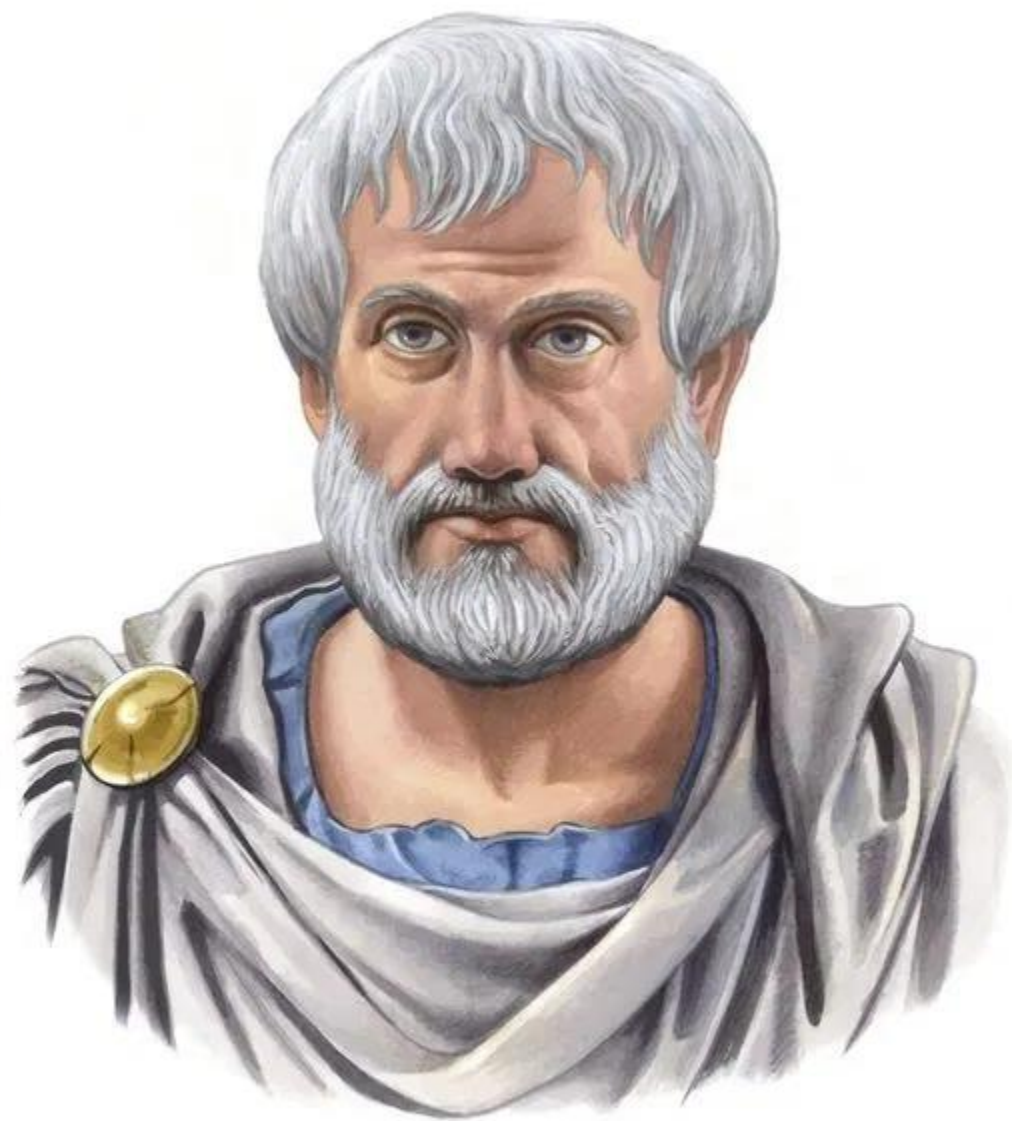
It's a Wall!

It's a Rope!

It's a Snake!

It's a Snake!

It's a Tree!



Techne

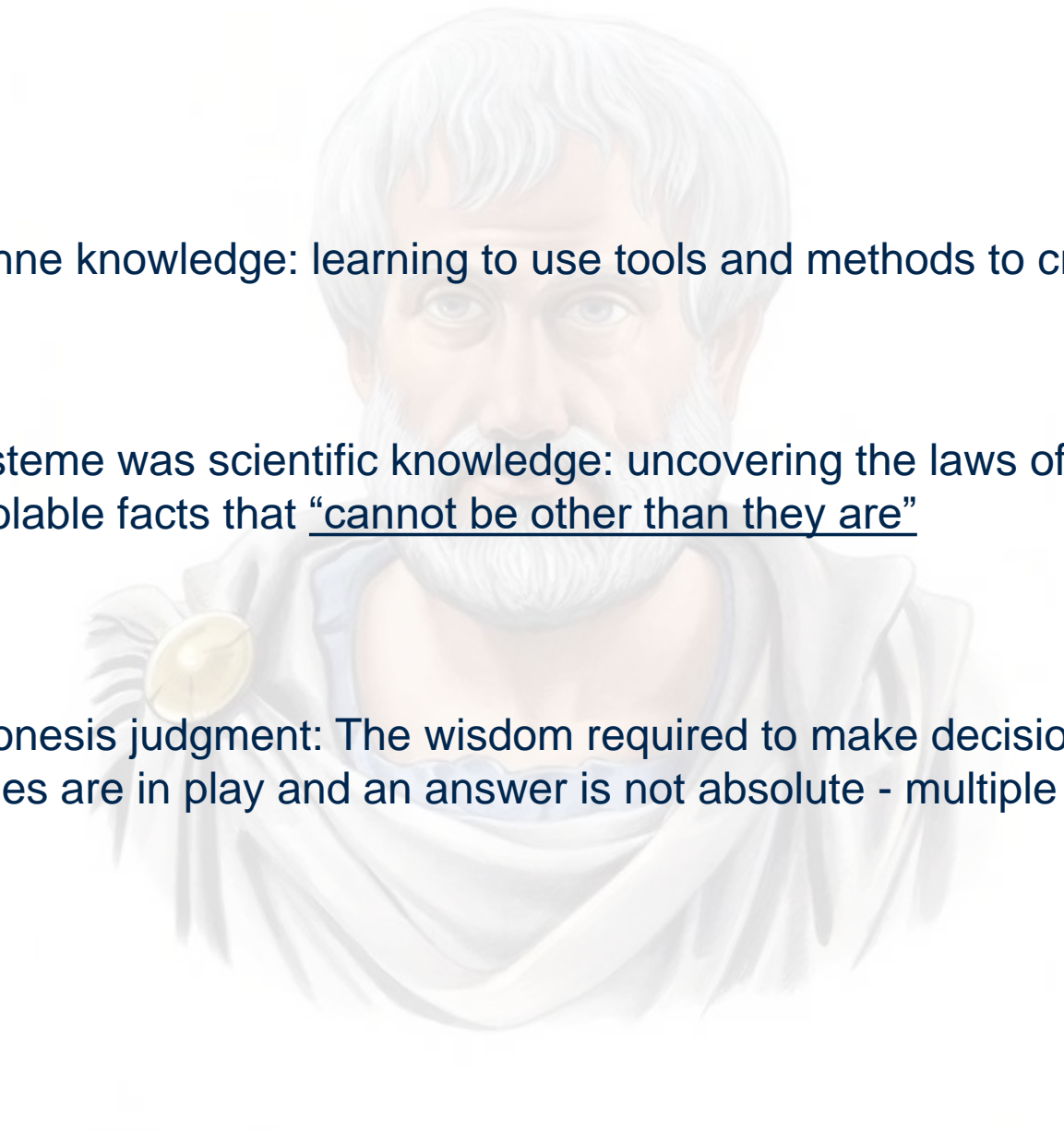
✓ Techne knowledge: learning to use tools and methods to create something

Episteme

✓ Episteme was scientific knowledge: uncovering the laws of nature and other inviolable facts that “cannot be other than they are”

Phronesis

✓ Phronesis judgment: The wisdom required to make decisions when competing values are in play and an answer is not absolute - multiple options are possible







Agility

- ✓ **Techne** allows a practitioner to understand how to create tools/ methods and exercise a high degree of **agility** in response to change or challenges

Creativity

- ✓ **Episteme** uncovers inviolable facts of economics, consumer behavior, and advertising and when infused with **creativity** generates new ideas, new ways to detect patterns, and alternative possibilities in problem solving

Business  
Acumen

- ✓ **Phronesis** ensures **business acumen** is injected in the decision making process when competing values are in play and an answer is not absolute (strategy)

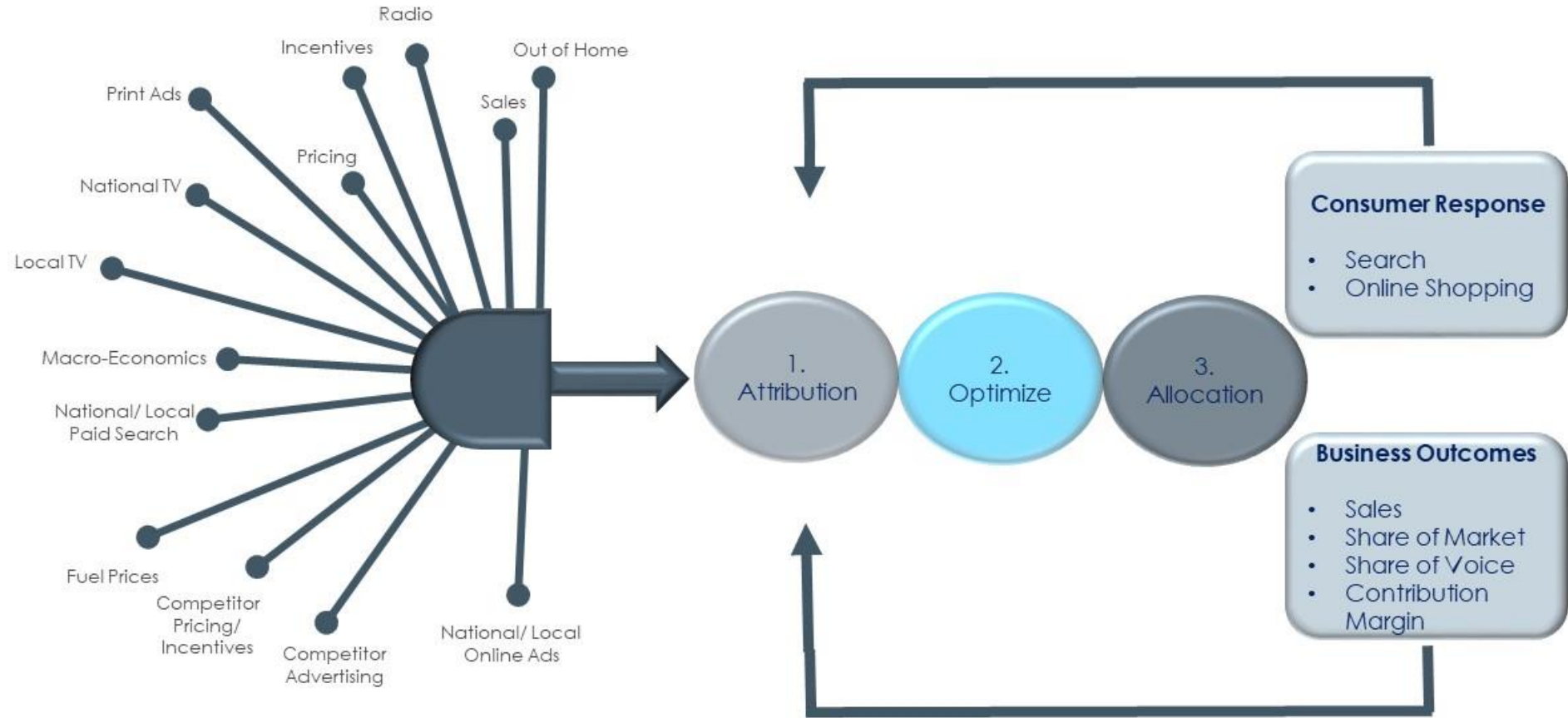


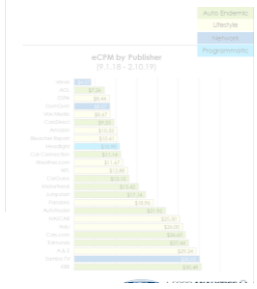
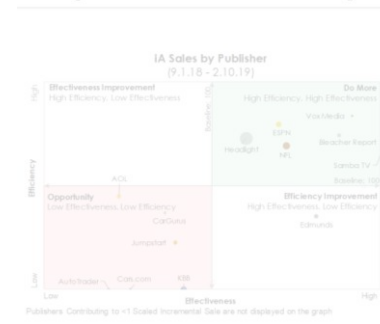
Cotton Mouth and the Psycho-Billy Cadillac



**MROI** (Marketing Return on Investment)

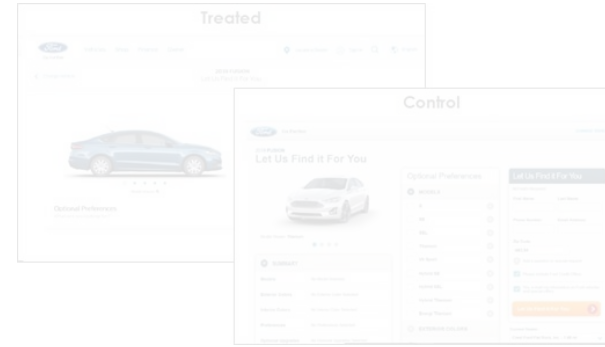
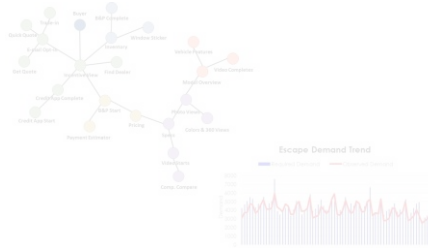
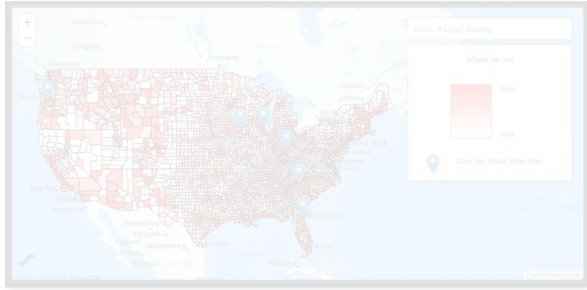






## Digital Attribution & Addressable TV

# MROI



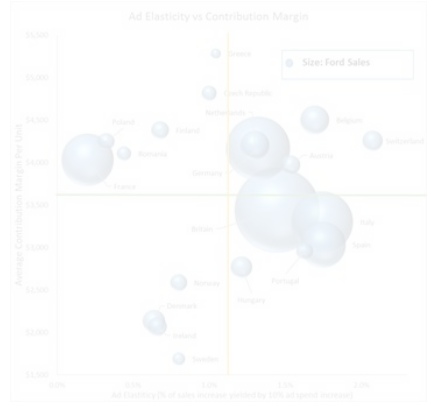
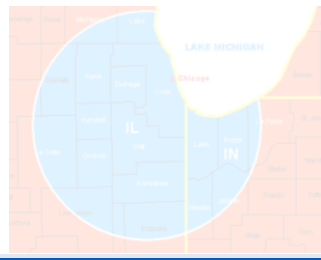
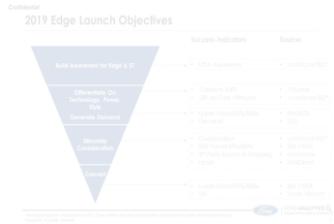
**Audience  
Segmentation**

**Ford.com/ E-Comm.**

**Digital Attribution &  
Addressable TV**

**MROI** (Tier I & II)





**Local Market Analytics**

**Campaign Analytics**

**Global Analytics**

**Audience Segmentation**

**Ford.com/ E-Comm.**

**Digital Attribution & Addressable TV**

**MROI**





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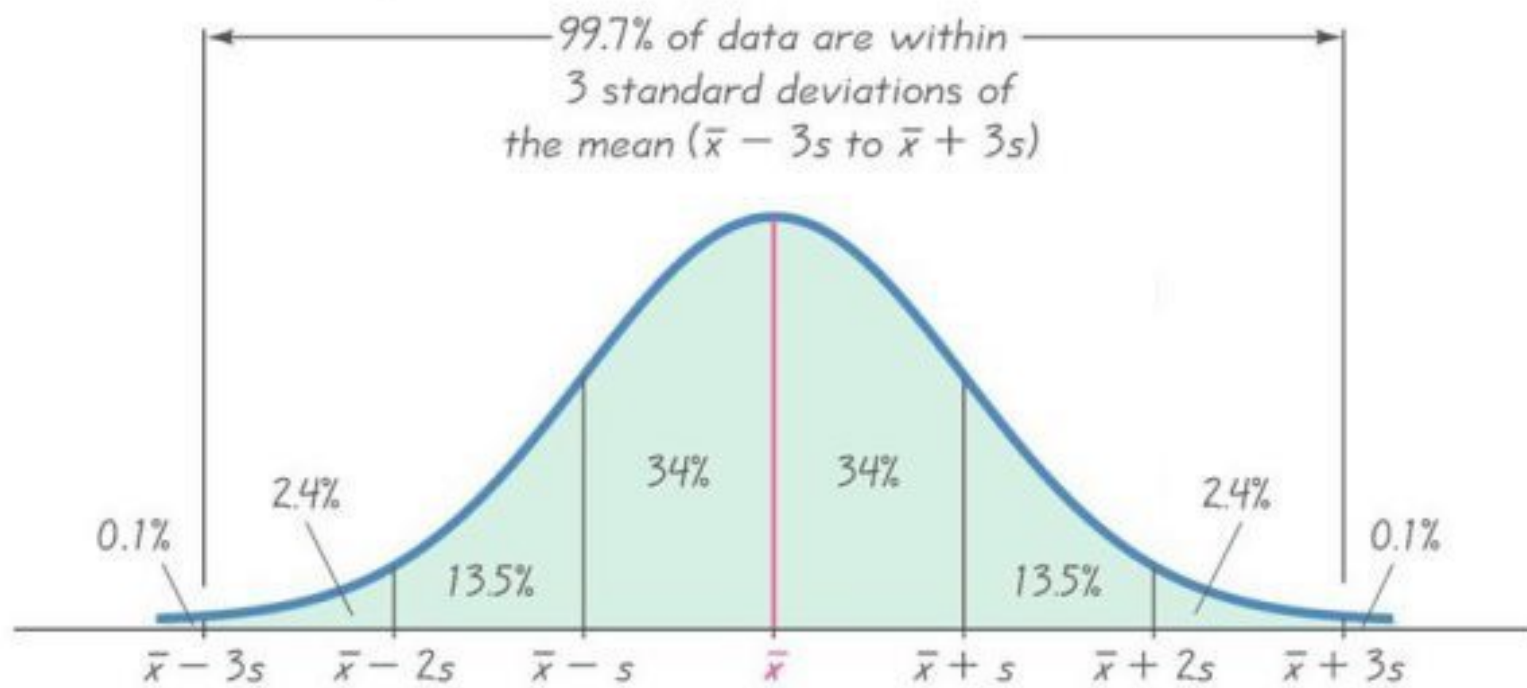
Creativity

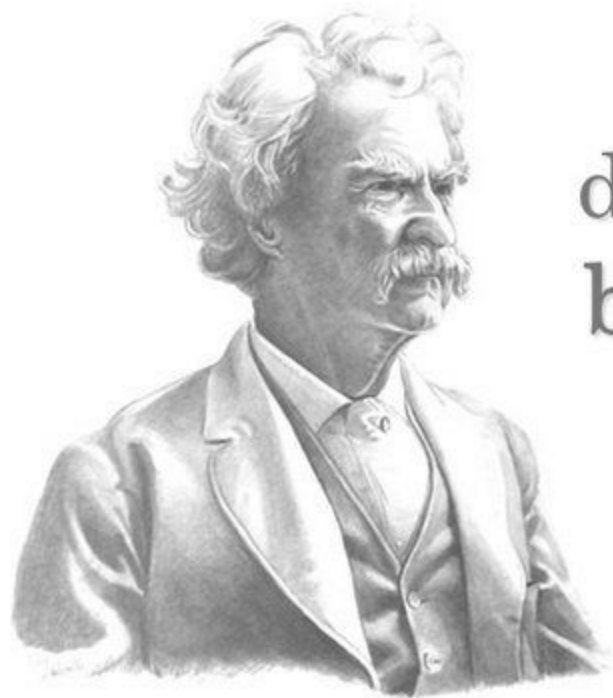
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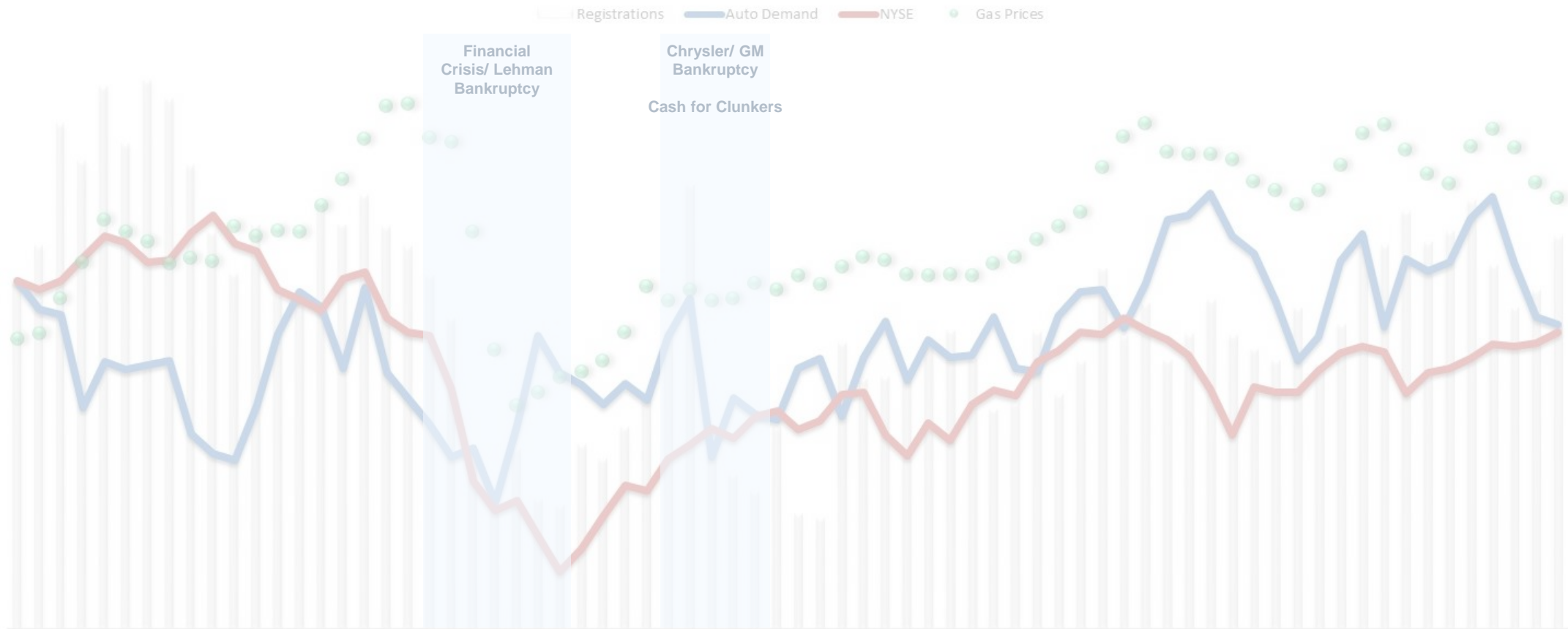






History  
doesn't repeat itself,  
but it does rhyme.

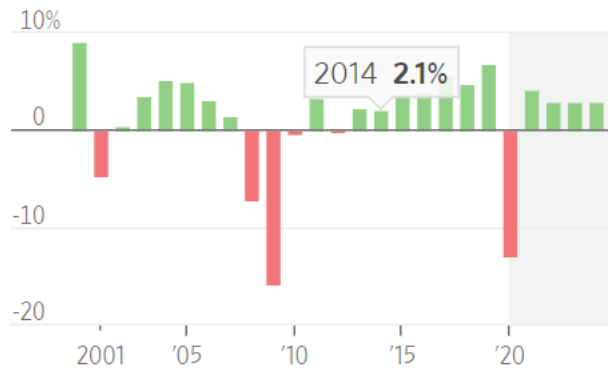
Mark Twain







### Change in U.S. advertising spending from previous year



## Report: US TV advertisers look to cut US\$1.5bn from Q3 spending

NFL sponsor Pepsi among brands planning to cancel up to 50% of marketing outlay.

## Disney Slashed Ad Spending on Facebook Amid Growing Boycott

Hundreds of advertisers have paused spending on social network due to concerns about hate speech, divisive content

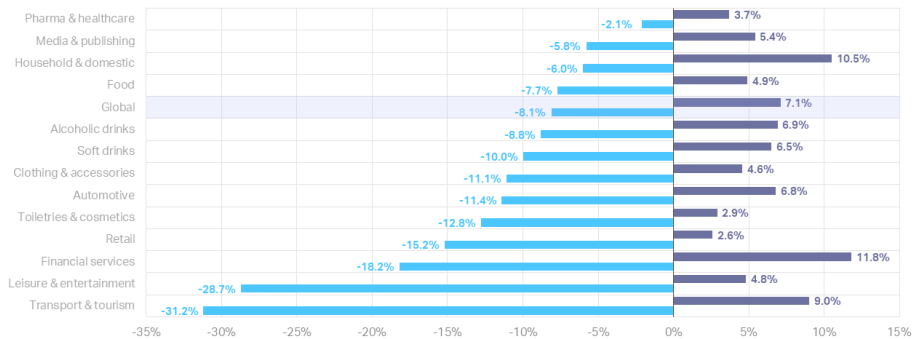
BARRON'S

Topics Magazine Data Advisor Penta

WARC DATA Global Ad Trends, May 2020

### Global, Year-on-year % change, US dollars, 2020

■ Pre-outbreak ■ Post-outbreak



Note: Data are net of discounts, include agency commission and exclude production costs. Data include display, search and classified advertising spend. SOURCE: WARC Data, Nielsen Ad Intel

© Copyright WARC2020. All rights reserved.

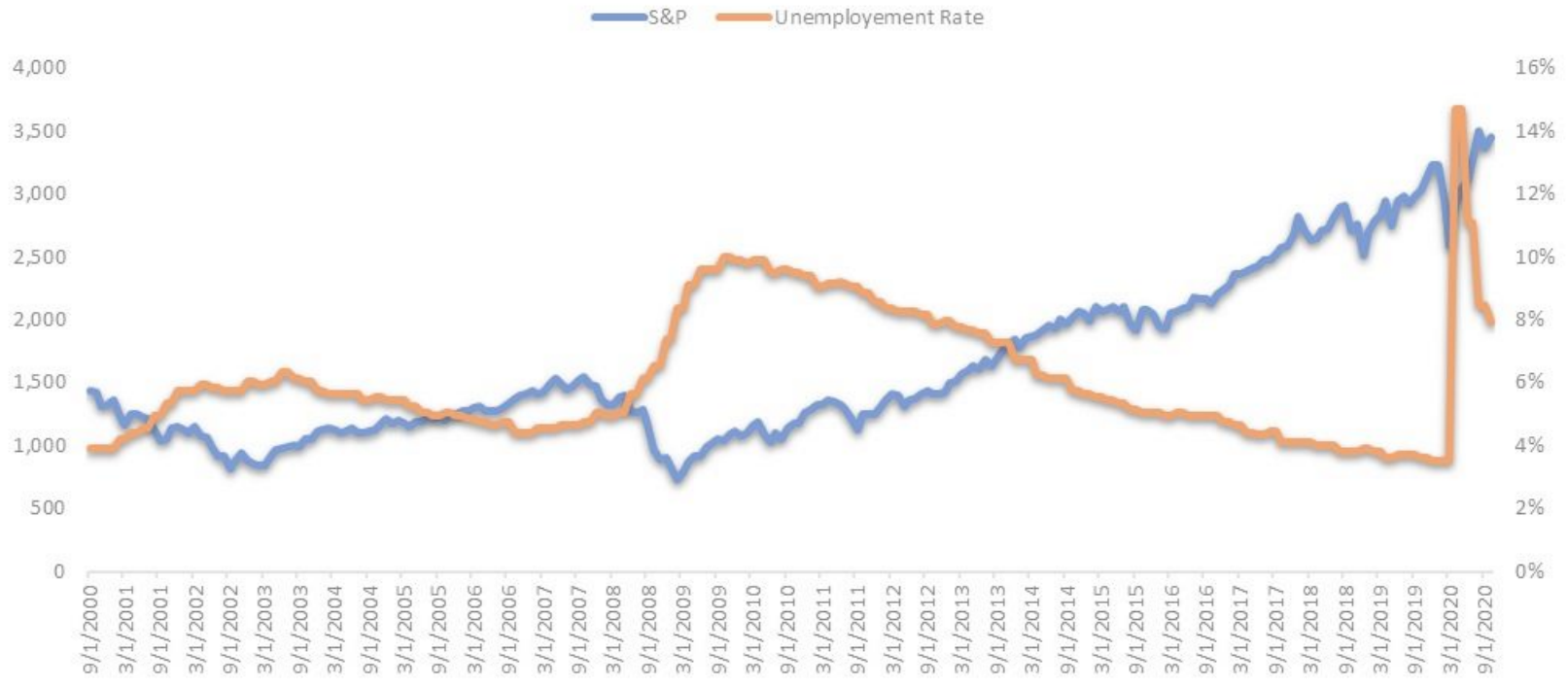
## Ad-Spending Collapse Will Be Worse Than in the Financial Crisis, Survey Finds

By Eric J. Savitz March 27, 2020 4:09 pm ET

Text size (−) (+)



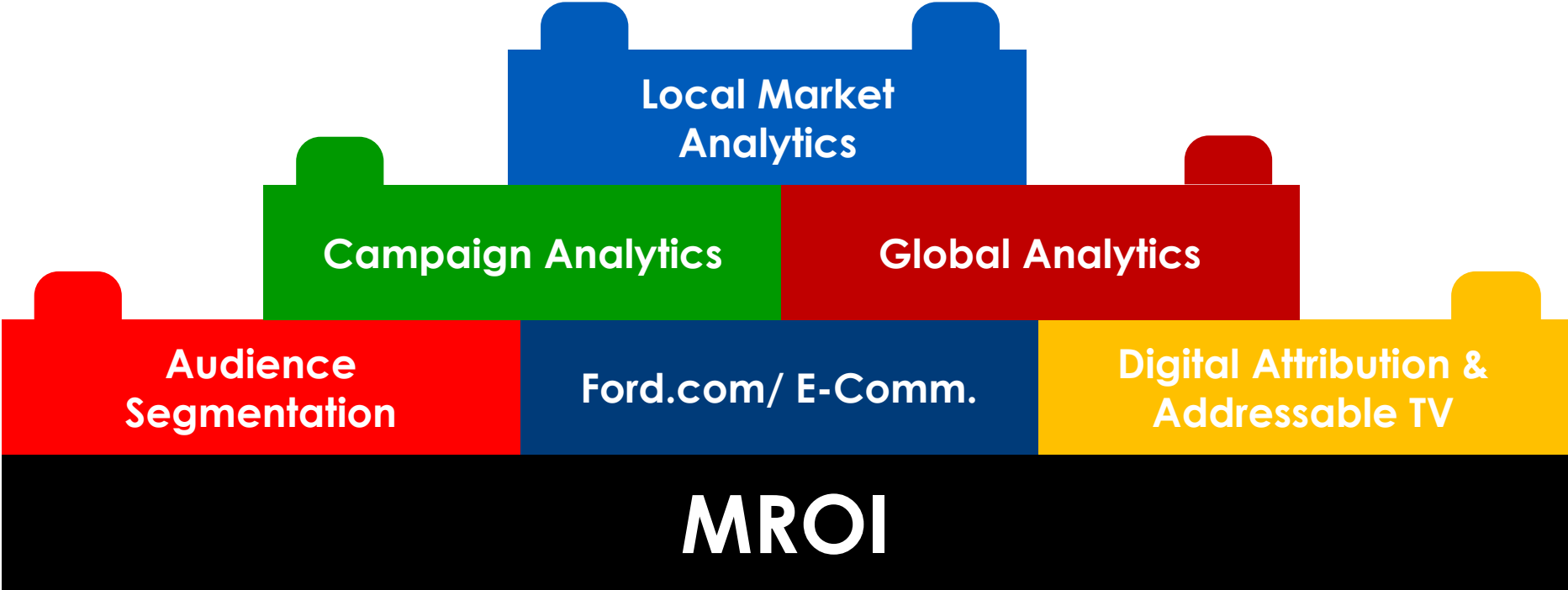
Advertising budgets will likely fall even more in the current coronavirus-driven economic slowdown than they did in the crisis of 2008-09, according to a new survey.













## 2019 Automotive Shopping Behavior

Question 1:  
What's happening to Industry Demand.

Question 2:  
Where's Demand going



## 2019 Automotive Shopping Behavior

Question 1:  
What's happening to Industry Demand.

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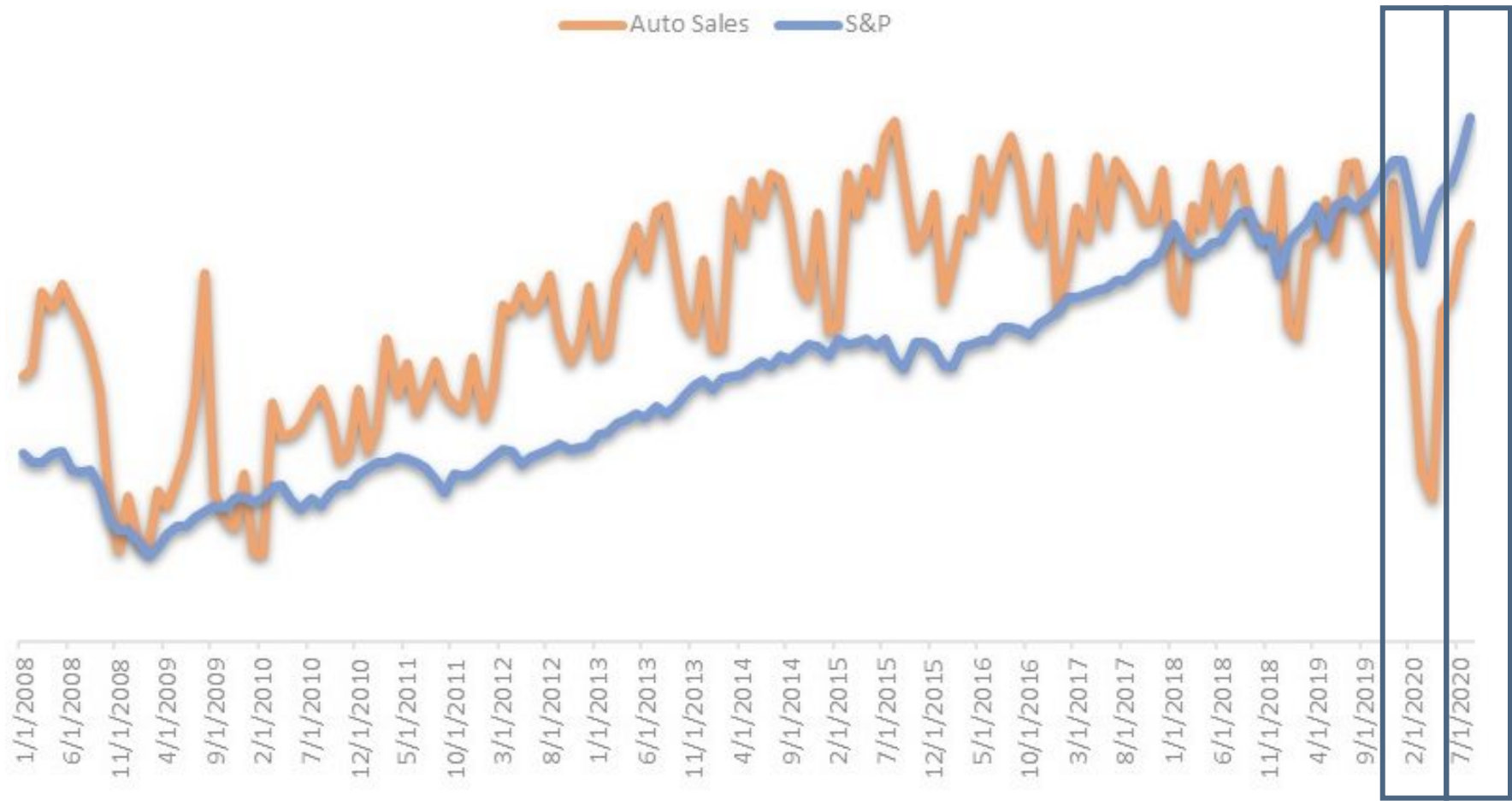


## 2019 Automotive Shopping Behavior

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Question 2:  
Where's Demand going











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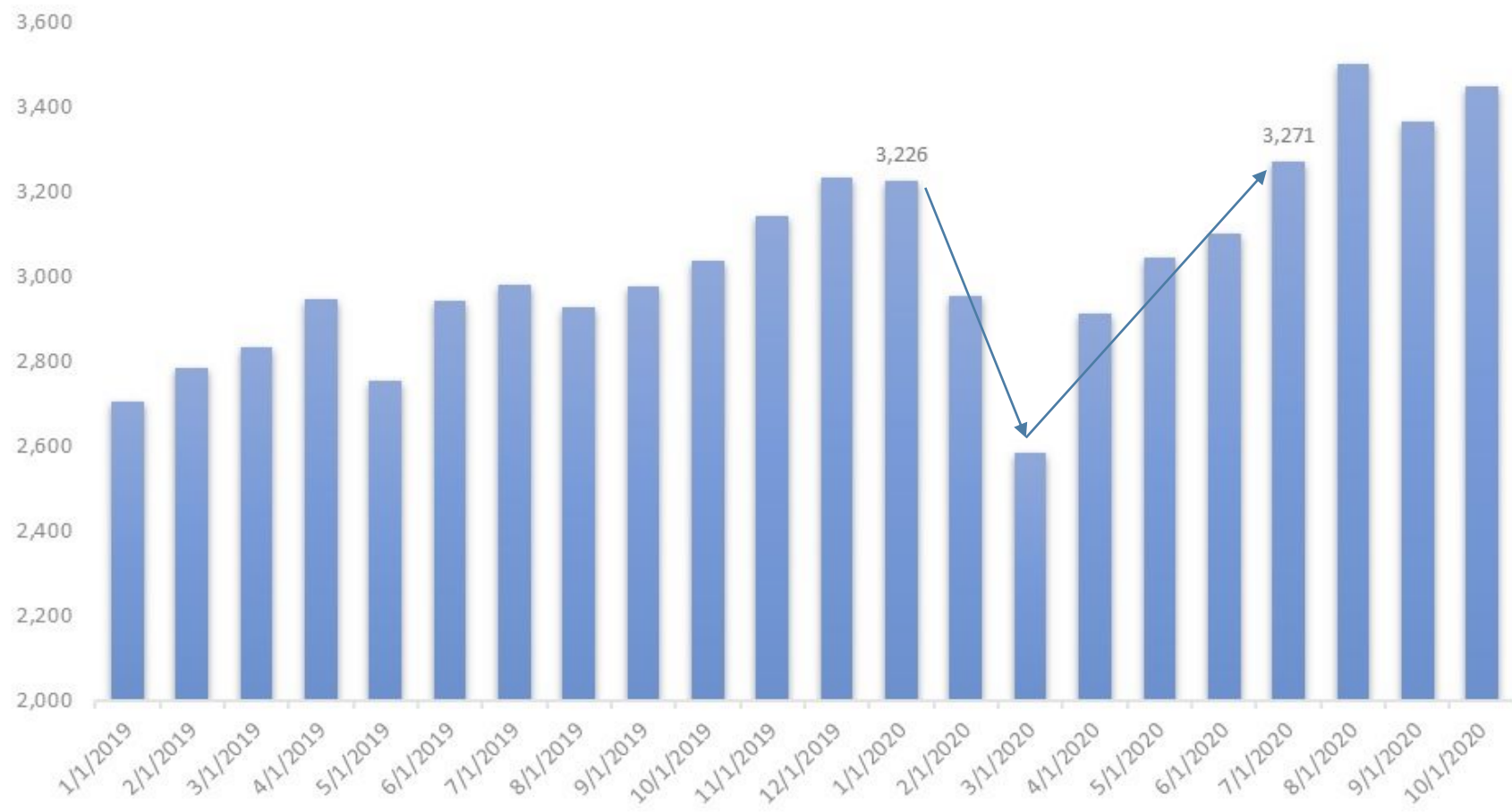
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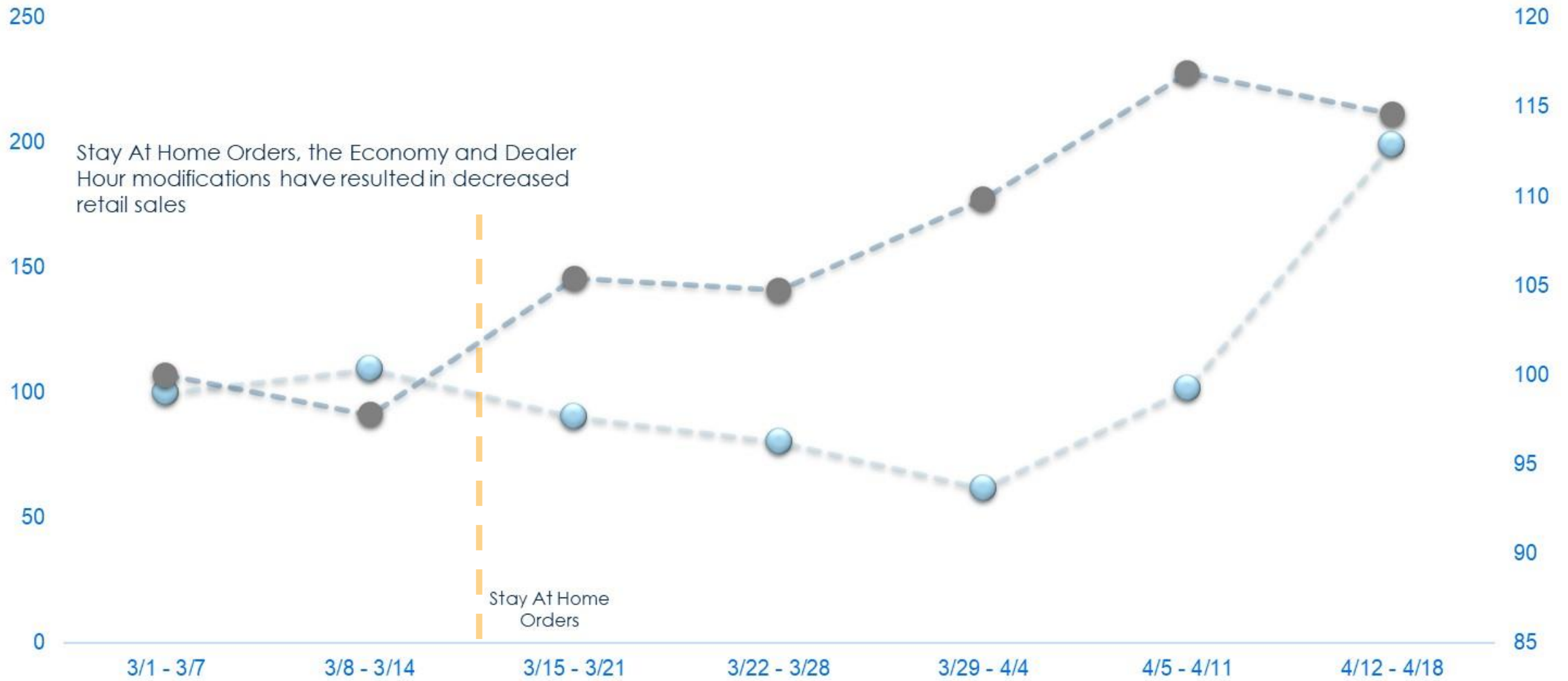
“It is not enough to do your best you must know what to do and then do your best”

Edward Deming



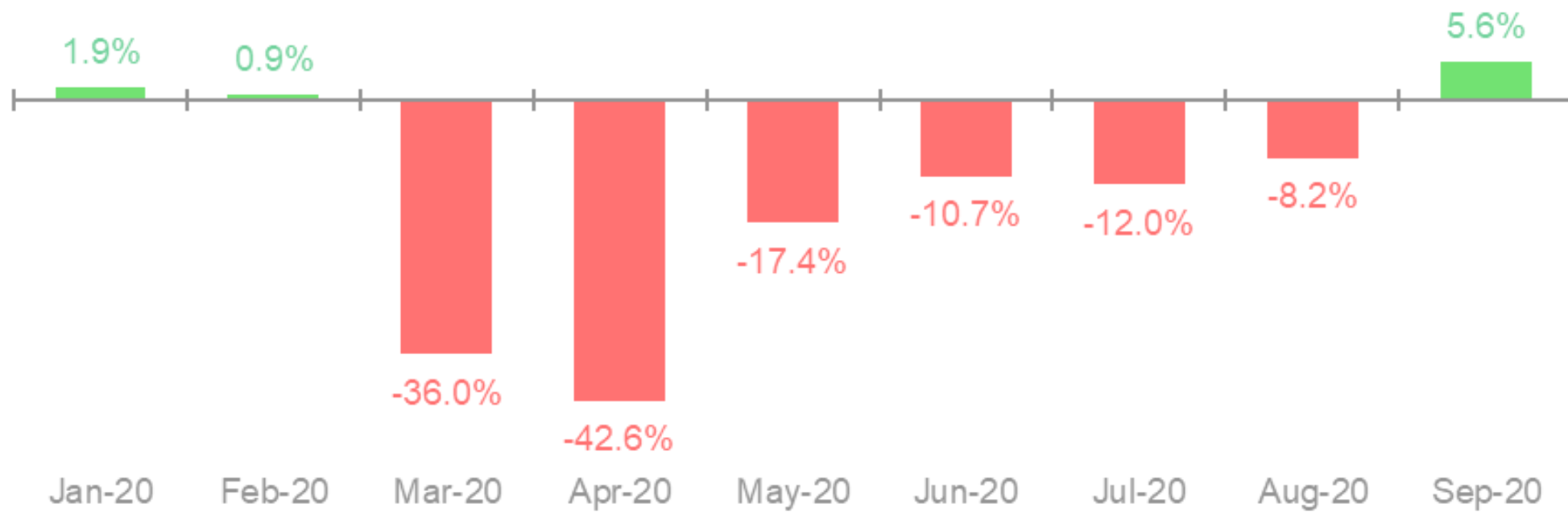
**MROI** (Marketing Return on Investment)













	Sep-19	Sep-20	Δ (ppts)	Memo: Sales Δ (%)
Toyota	13.9%	13.3%	-0.6	1%
<b>Ford</b>	10.9%	11.6%	<b>+0.7</b>	<b>13%</b>
Chevrolet	10.9%	11.4%	+0.6	11%
Honda	10.0%	9.5%	-0.5	1%
Jeep	5.9%	5.6%	-0.3	1%
Nissan	5.5%	4.9%	-0.6	(7%)
Subaru	4.4%	4.8%	+0.4	15%
Kia	3.9%	4.5%	+0.6	21%
Hyundai	3.9%	4.3%	+0.4	16%
RAM	3.4%	4.2%	+0.7	29%
GMC	3.5%	3.7%	+0.2	11%
Volkswagen	2.3%	2.2%	-0.1	0%
Mazda	1.7%	1.9%	+0.2	18%
Dodge	1.5%	1.5%	-0.1	(0%)
Buick	1.4%	1.3%	-0.0	2%
Chrysler	0.6%	0.4%	-0.1	(18%)
Mitsubishi	0.6%	0.4%	-0.2	(22%)
Other	0.5%	0.5%	+0.0	16%
Premium	15.1%	13.7%	-1.3	(4%)
Super Premium	0.1%	0.1%	+0.0	22%

	2019 YTD	2020 YTD	Δ (ppts)	Memo: Sales Δ (%)
Toyota	13.5%	12.8%	-0.7	(18%)
<b>Ford</b>	11.2%	11.4%	<b>+0.3</b>	<b>(12%)</b>
Chevrolet	10.7%	10.9%	+0.2	(12%)
Honda	10.5%	9.8%	-0.8	(20%)
Jeep	5.9%	5.8%	-0.0	(14%)
Nissan	5.8%	5.1%	-0.8	(26%)
Subaru	4.7%	4.7%	+0.0	(13%)
Kia	3.9%	4.4%	+0.5	(3%)
Hyundai	3.9%	4.6%	+0.7	2%
RAM	3.6%	4.0%	+0.4	(4%)
GMC	3.3%	3.6%	+0.3	(7%)
Volkswagen	2.3%	2.3%	+0.1	(12%)
Mazda	1.9%	2.1%	+0.2	(4%)
Dodge	1.6%	1.5%	-0.1	(17%)
Buick	1.4%	1.2%	-0.1	(22%)
Chrysler	0.6%	0.5%	-0.2	(37%)
Mitsubishi	0.6%	0.5%	-0.1	(30%)
Other	0.5%	0.5%	+0.0	(9%)
Premium	14.0%	14.0%	+0.0	(14%)
Super Premium	0.1%	0.1%	+0.0	10%



**Added Bonus:**

**Mike gets on a  
Soap Box**



thank  
thank  
you!