



The Required Wisdom of Crowds

This War Will Not Be Won Alone

August 17, 2016



ACCELERATING INNOVATION for the Intelligence Community®

Strength in Numbers

- A faked economic “recovery” has set the stage for a double whammy: increased attacks against pressured IT budgets
- On top of that, many, if not most security products fail to deliver leading to a false sense of security and wasted assets
- Therefore, a new approach is required to have any shot at winning the war and the sharing of information, best practices will emerge as a critical part of any successful strategy

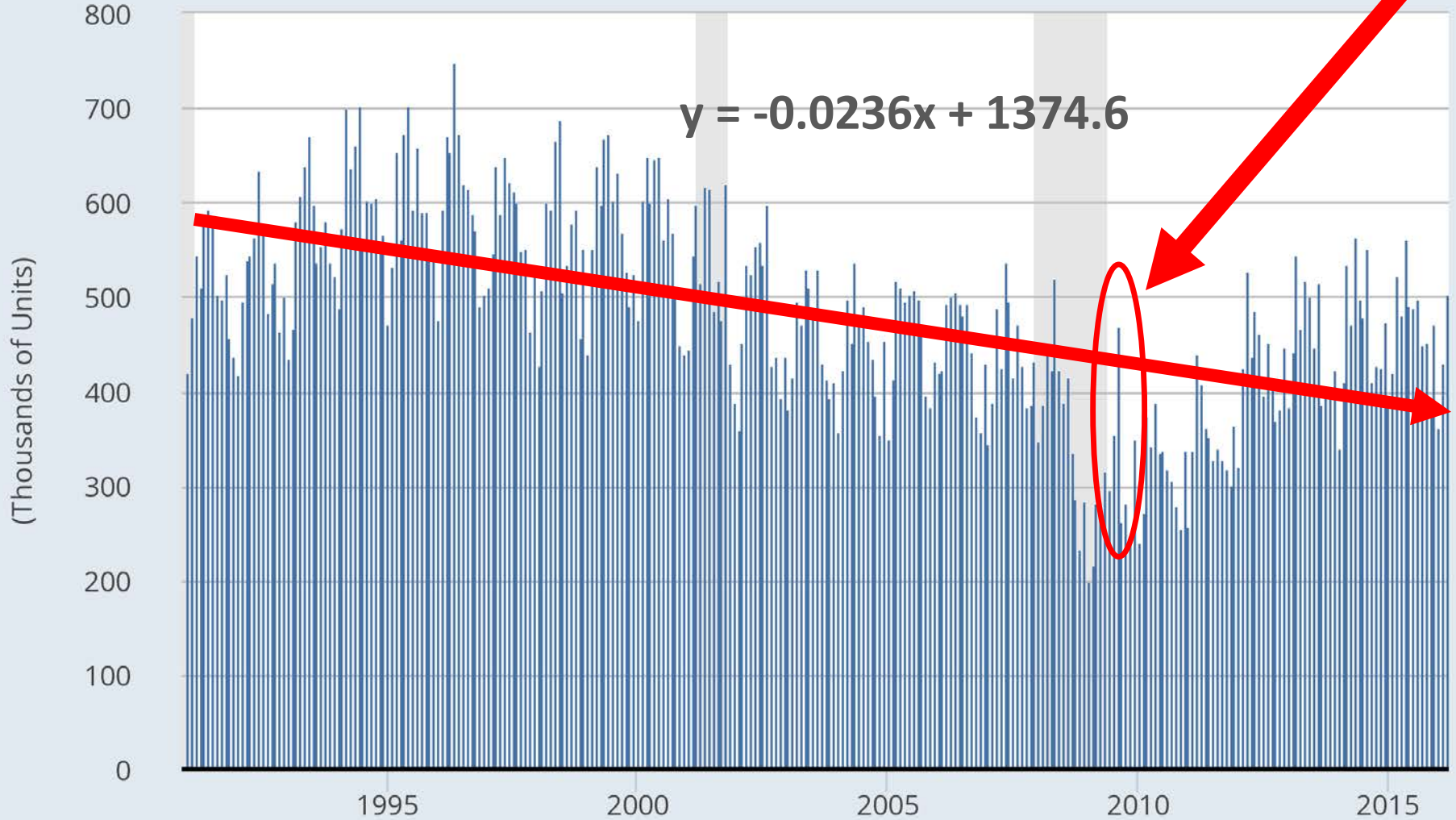
The Economic “Recovery” and the unintended consequences of sustaining the ruse



CARS FOR ALL!



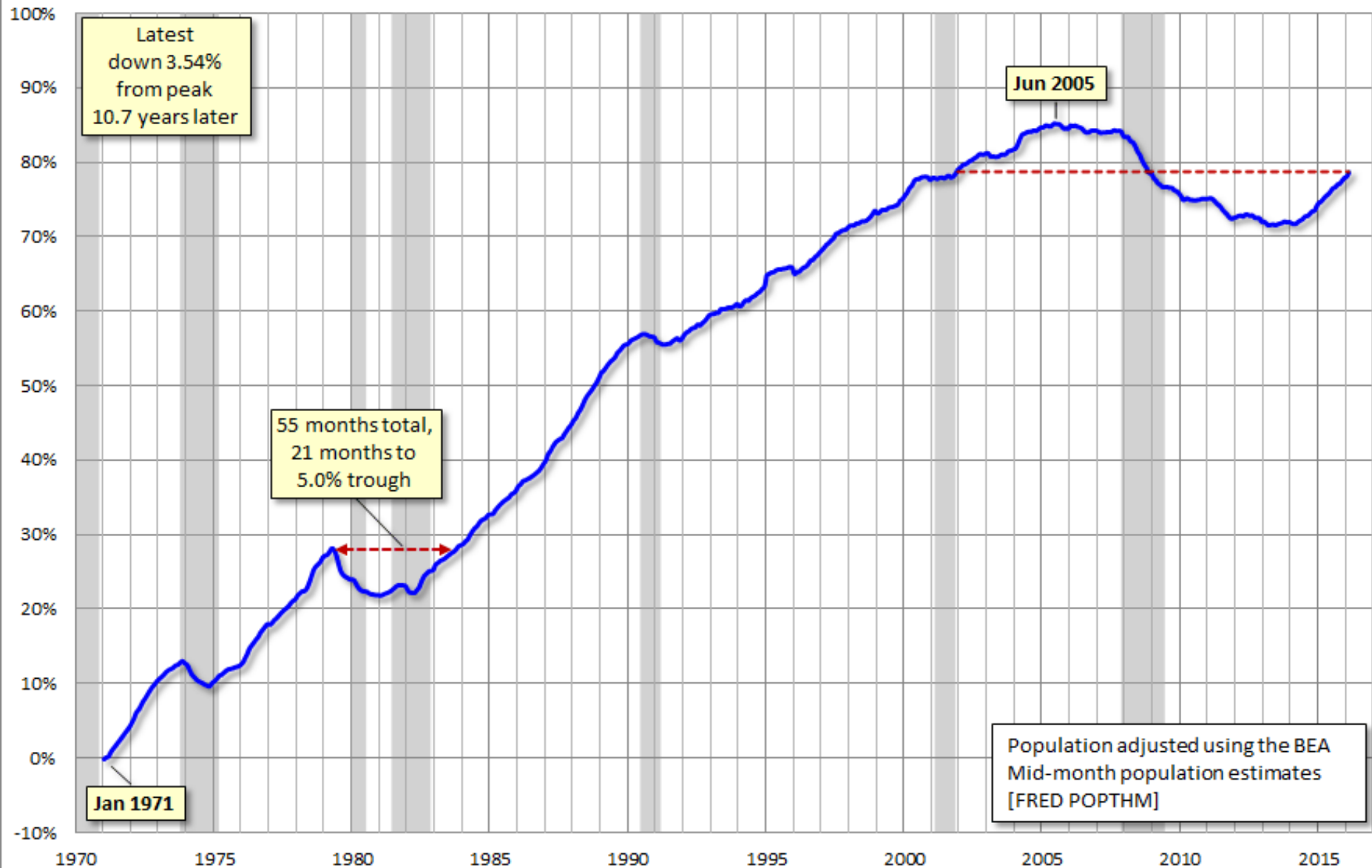
Motor Vehicle Retail Sales: Domestic Autos



Source: US. Bureau of Economic Analysis

Estimated Vehicle Miles Traveled on All Roads

Recessions Population-Adjusted Growth Current Level



HOMES FOR ALL!

ZIP. ZERO. NADA.

Purchase a new townhome at The Villas at Highgate in Upper Merionette Township, and you'll pay:

- **\$0 Money Down***
Receive 100% financing
- **\$0 Transfer Tax Paid at Settlement - Save Thousands!**

Plus, purchase today and you can choose from one of the following, for FREE:

- **\$0 For A FREE Finished Basement*** OR
- **\$0 For A FREE Upgraded Kitchen Package*** OR
- **\$0 For Paid Closing Costs***

Why pay more? Hurry in NOW - Become A Homeowner Here From Just \$1,198./mo.1*

You always get more at The Villas at Highgate.

- Includes basement with 3 BR, 40 to 55 sq. ft. finished feature
- Granite countertops, high efficiency stove, systems, full bathroom, garage
- Excellent flooring options available
- Excellent location - close to all major commuting routes, Pelee Island and shopping

The Villas at Highgate
1111 Lakeshore Blvd., Merionette, MI 48150 • Upper Merionette Township
616-366-9623

For more information visit us at www.heritagehomesgroup.com

Heritage

Model not to scale. All prices include applicable taxes. Call for details. All prices are estimates and may vary. © 2016 In-Q-Tel, Inc. All rights reserved. In-Q-Tel, Inc. is a registered trademark of In-Q-Tel, Inc. All other trademarks are the property of their respective owners. *See restrictions and limitations apply. Offer subject to change without notice. Offer ends 12/31/16.

USDA



Zero Down Home Loans

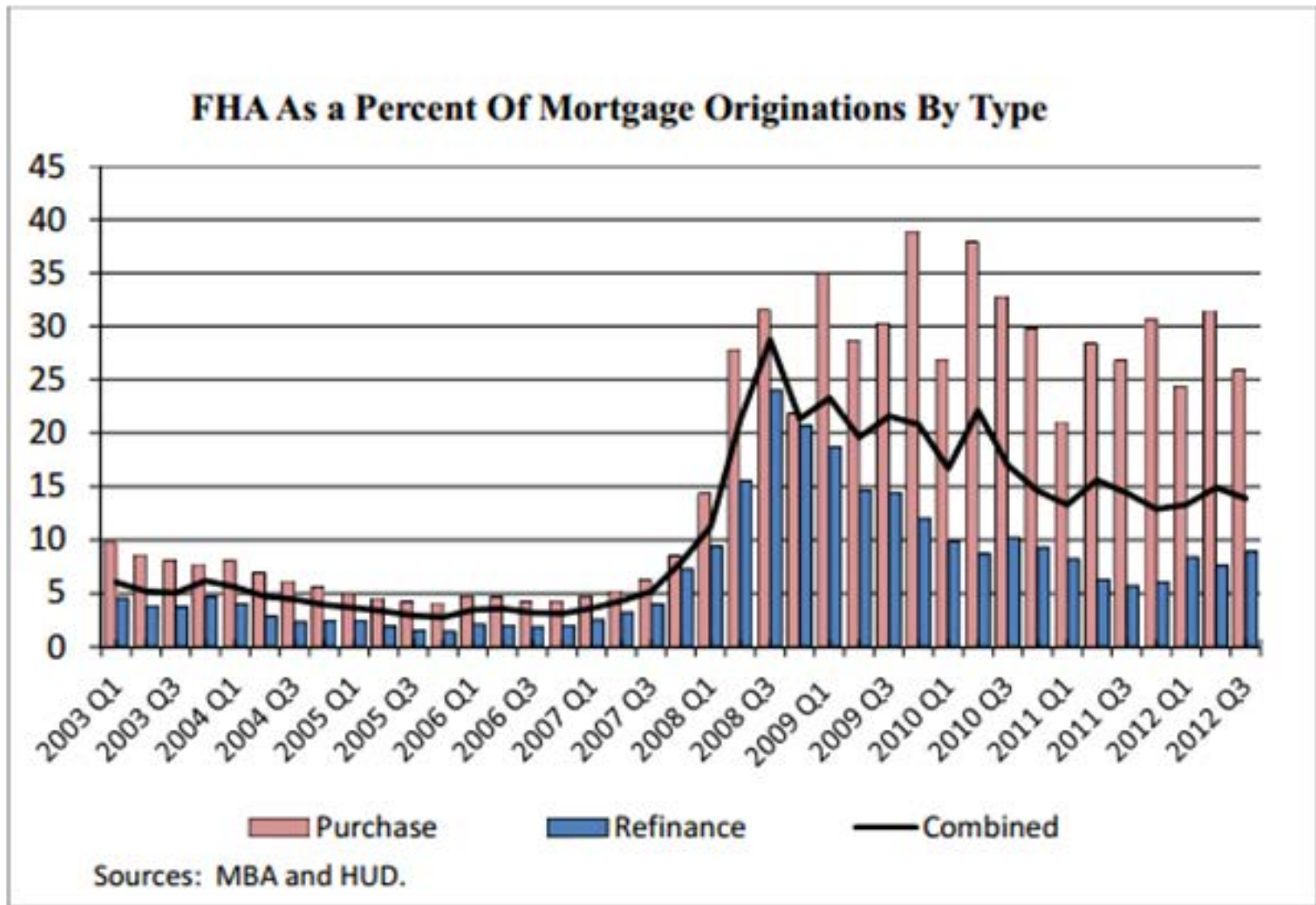
\$0 DOWN FIXED-RATE MORTGAGE*

No PMI Required!

[Apply Now](#)



We Are The Lenders...



How'd That Work Out?

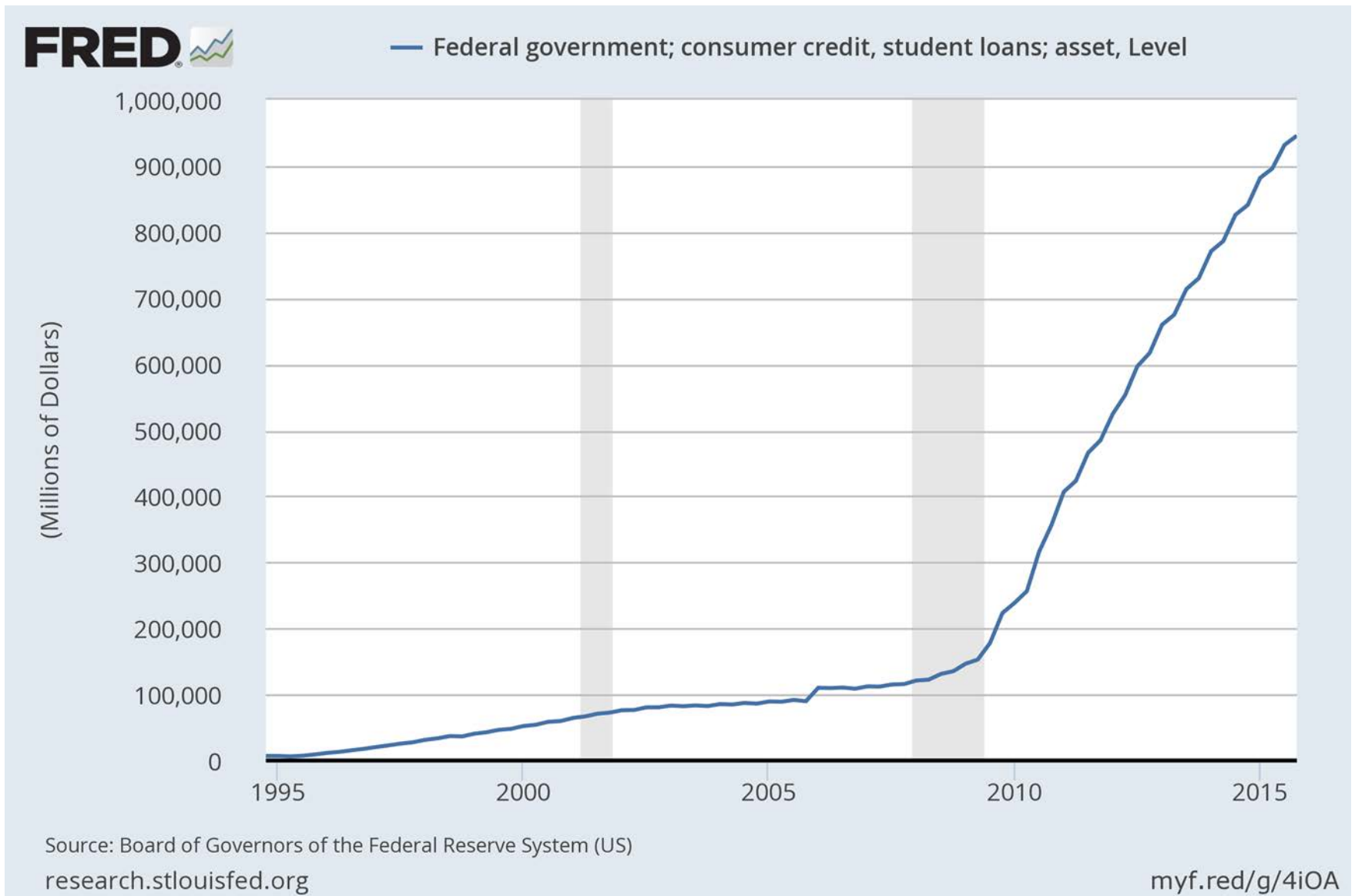
In Decline

Homeownership rate, seasonally adjusted



Source: Commerce Department | WSJ.com

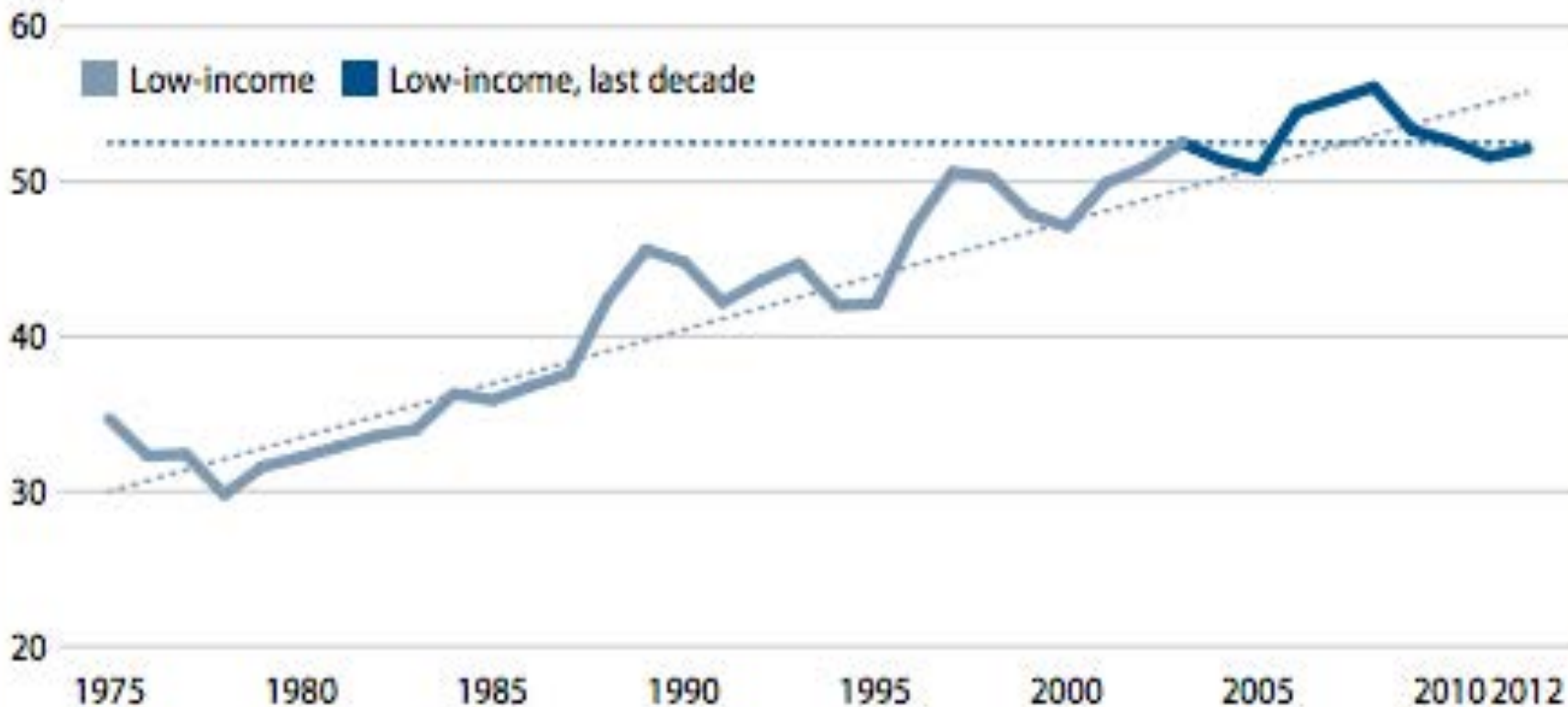
College For All!!!



COLLEGE FOR ALL!!!(?)

FIGURE 1

College-attendance rate for students from low-income families



Source: U.S. Department of Education, "Table 302.30. Percentage of recent high school completers enrolled in 2-year and 4-year colleges, by income level: 1975 through 2012," available at http://nces.ed.gov/programs/digest/d13/tables/dt13_302.30.asp (last accessed September 2014).

Here's Your Diploma and \$30,000 Loan Docs



college debt



All

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Search tools

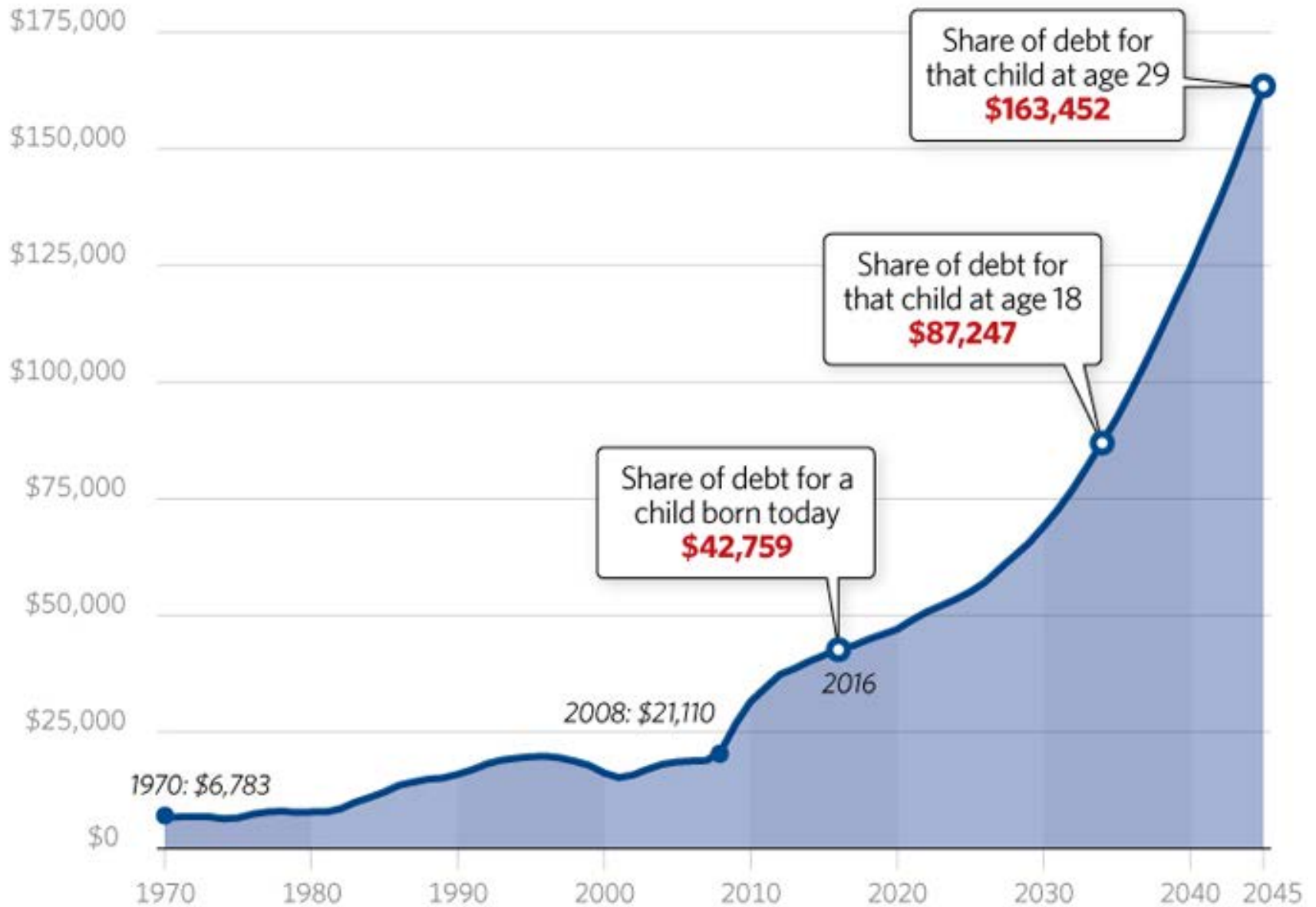
About 242,000,000 results (0.67 seconds)

Seven in 10 seniors (69%) who graduated from public and nonprofit colleges in 2014 had **student loan debt**, with an average of **\$28,950** per borrower.

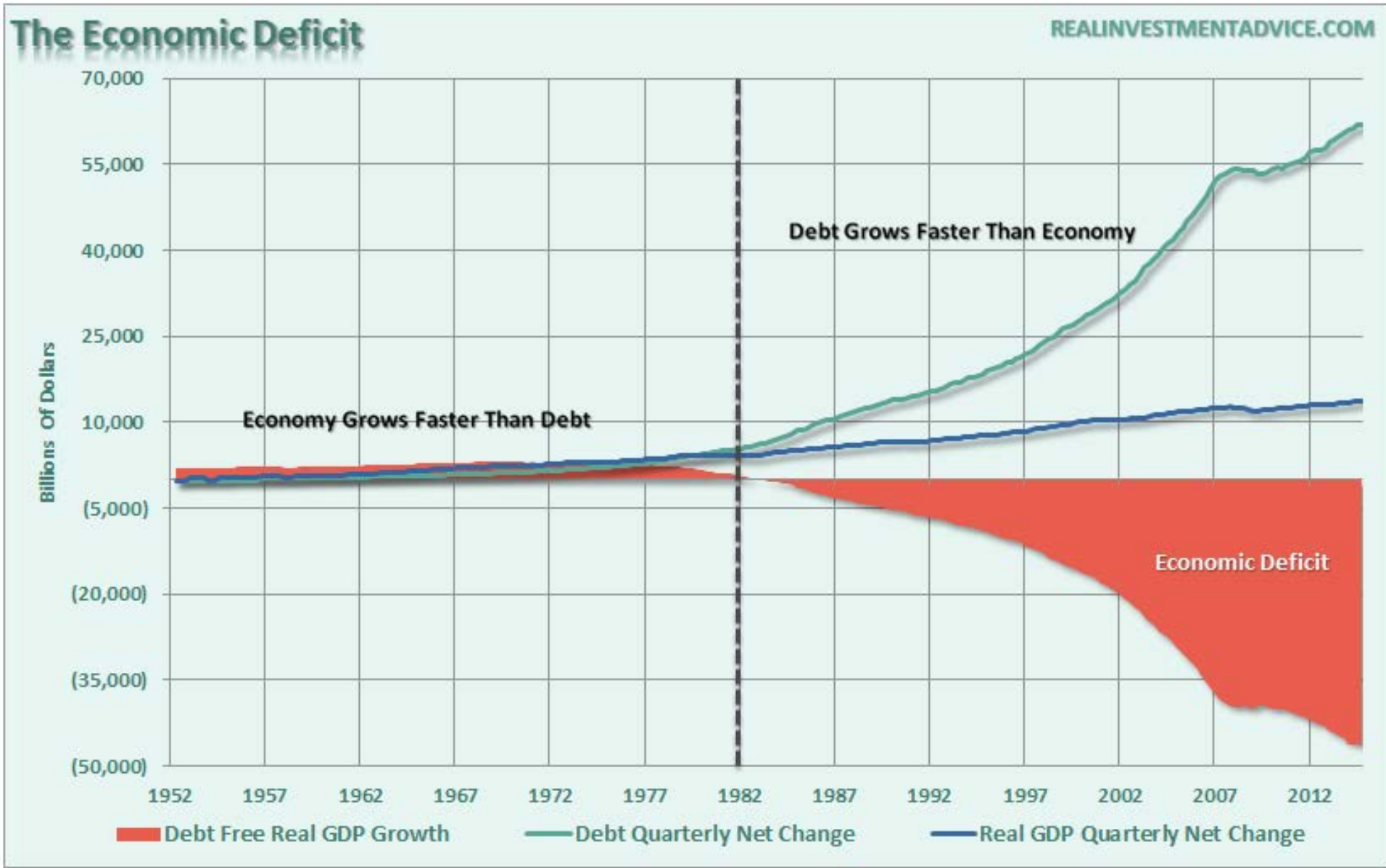


State by State Data | The Institute For College Access and Su...
ticas.org/posd/map-state-data-2015

The US Govt Bill For All The Programs...



But They Are Stimulating The Economy!!



The Ultimate Ruse

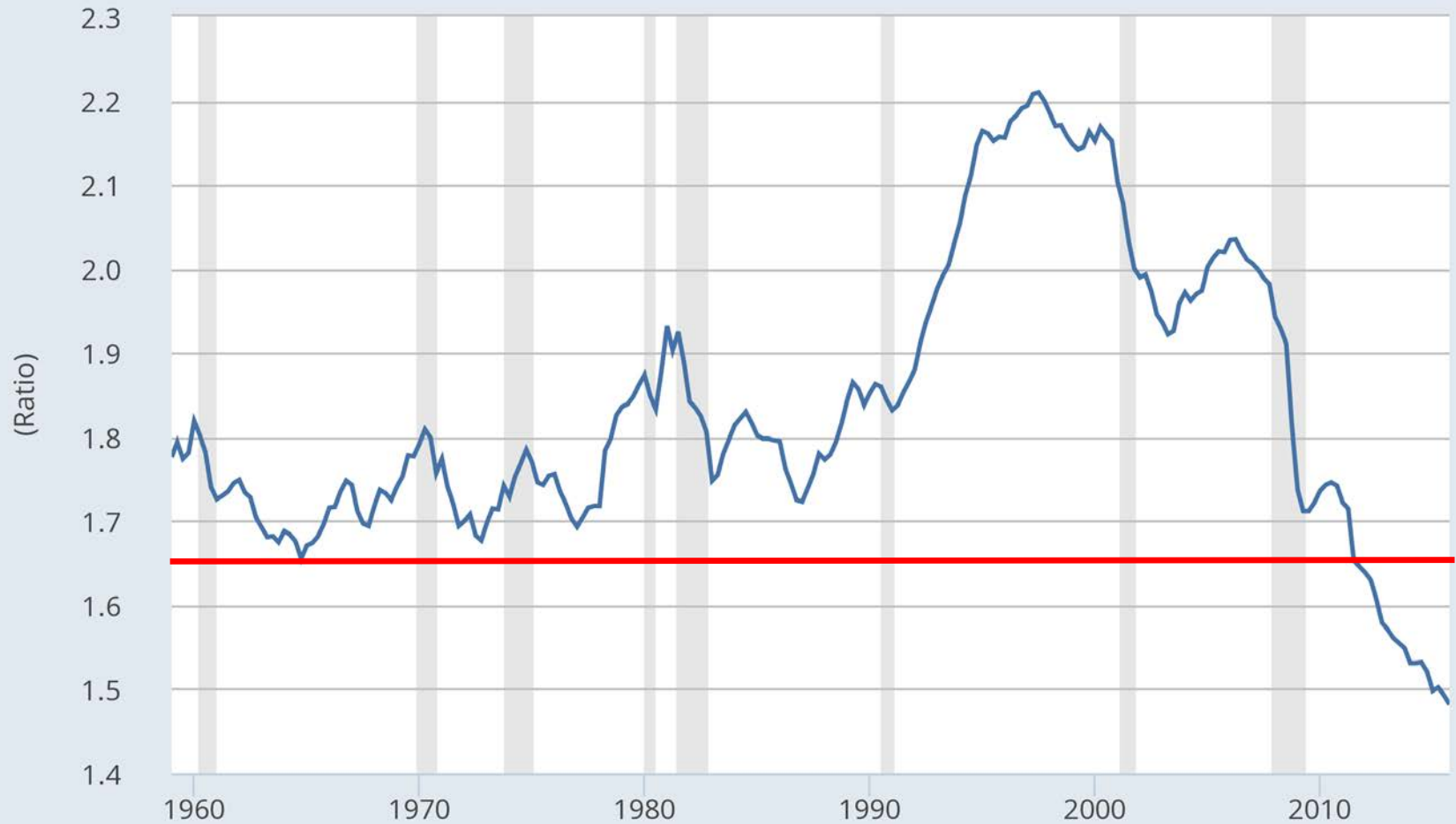


SO WHAT???

NONE OF IT HAS WORKED

FRED 

— Velocity of M2 Money Stock



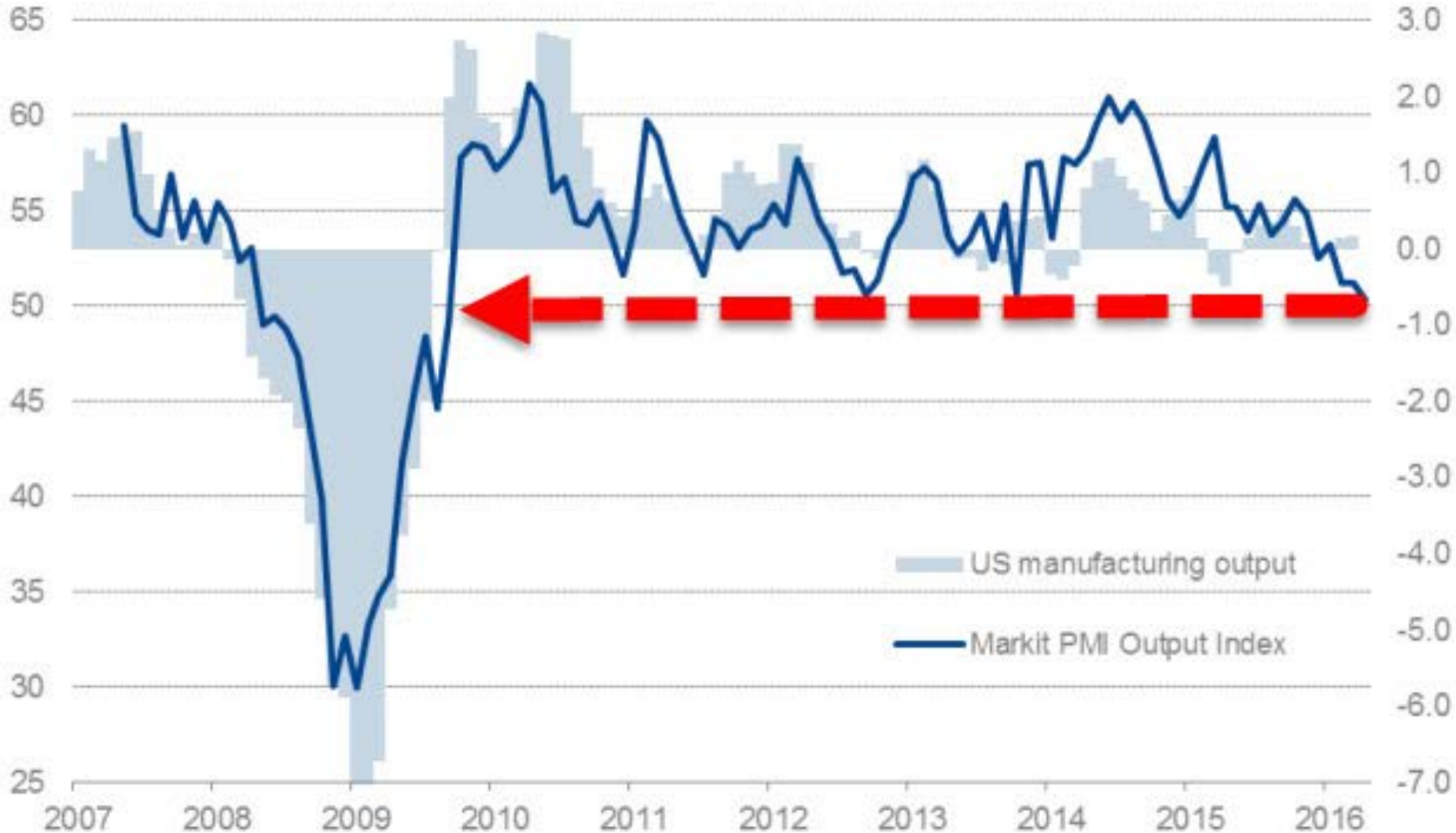
Source: Federal Reserve Bank of St. Louis
research.stlouisfed.org

myf.red/g/3hQc

Manufacturing output

Markit US Manufacturing PMI Output Index

Output, 3m/3m % change



Jobs Anyone?

FRED

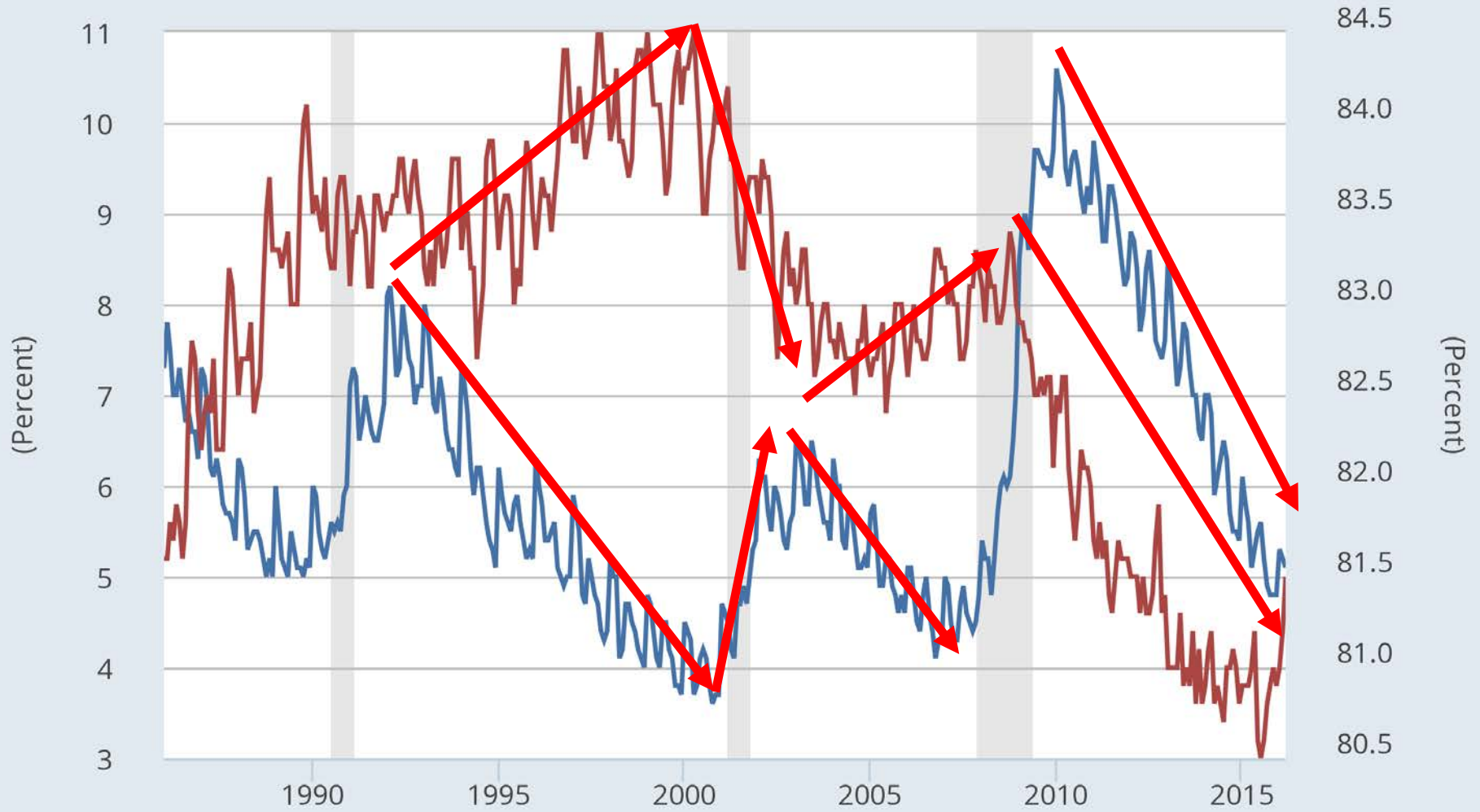
— Civilian Labor Force Participation Rate



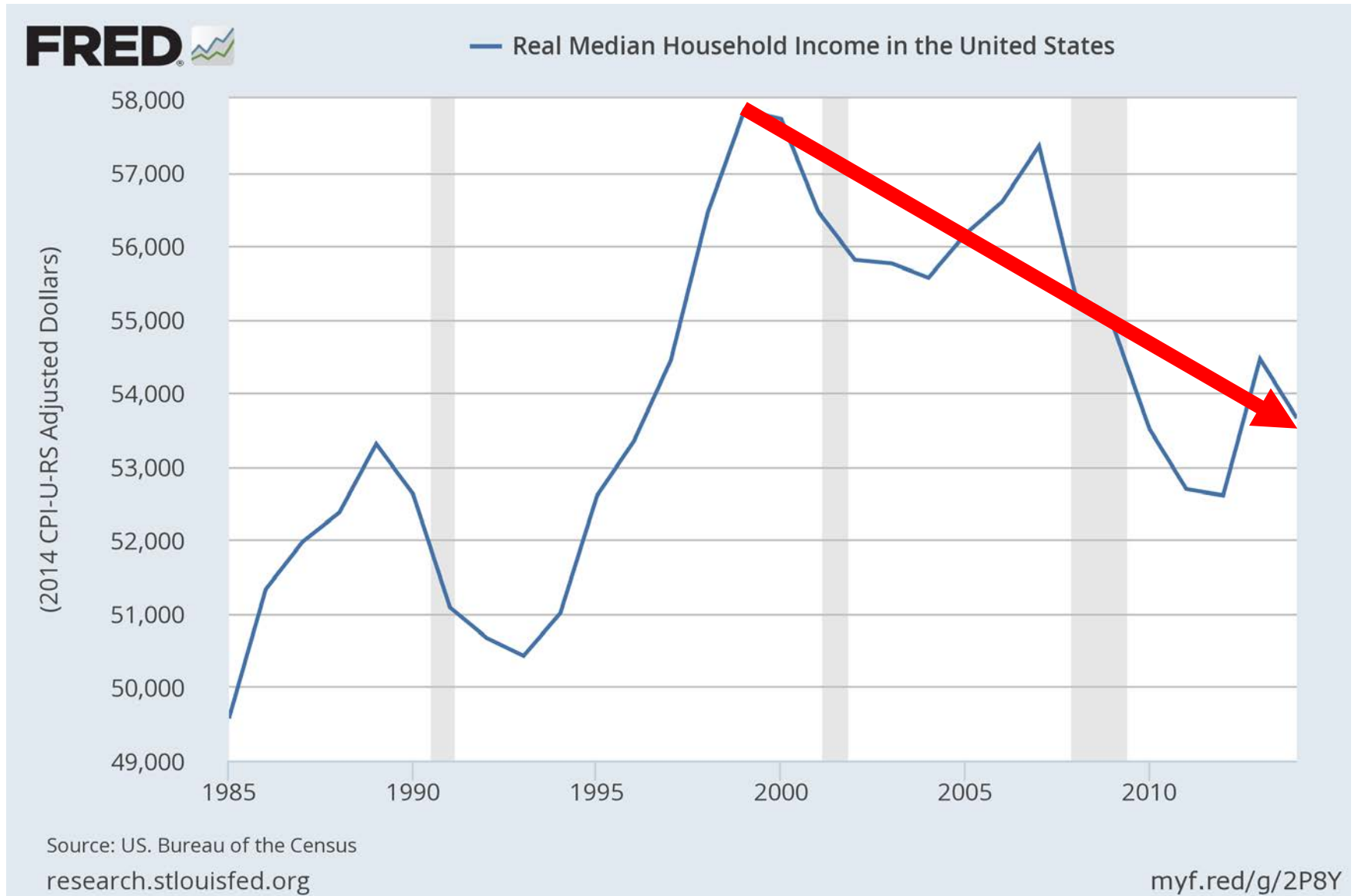
Source: US. Bureau of Labor Statistics

Shaded areas indicate US recessions - 2015 research.stlouisfed.org

— Civilian Unemployment Rate (left)
— Civilian Labor Force Participation Rate: 25 to 54 years (right)



BTW: Consumers Are ~70% of GDP..



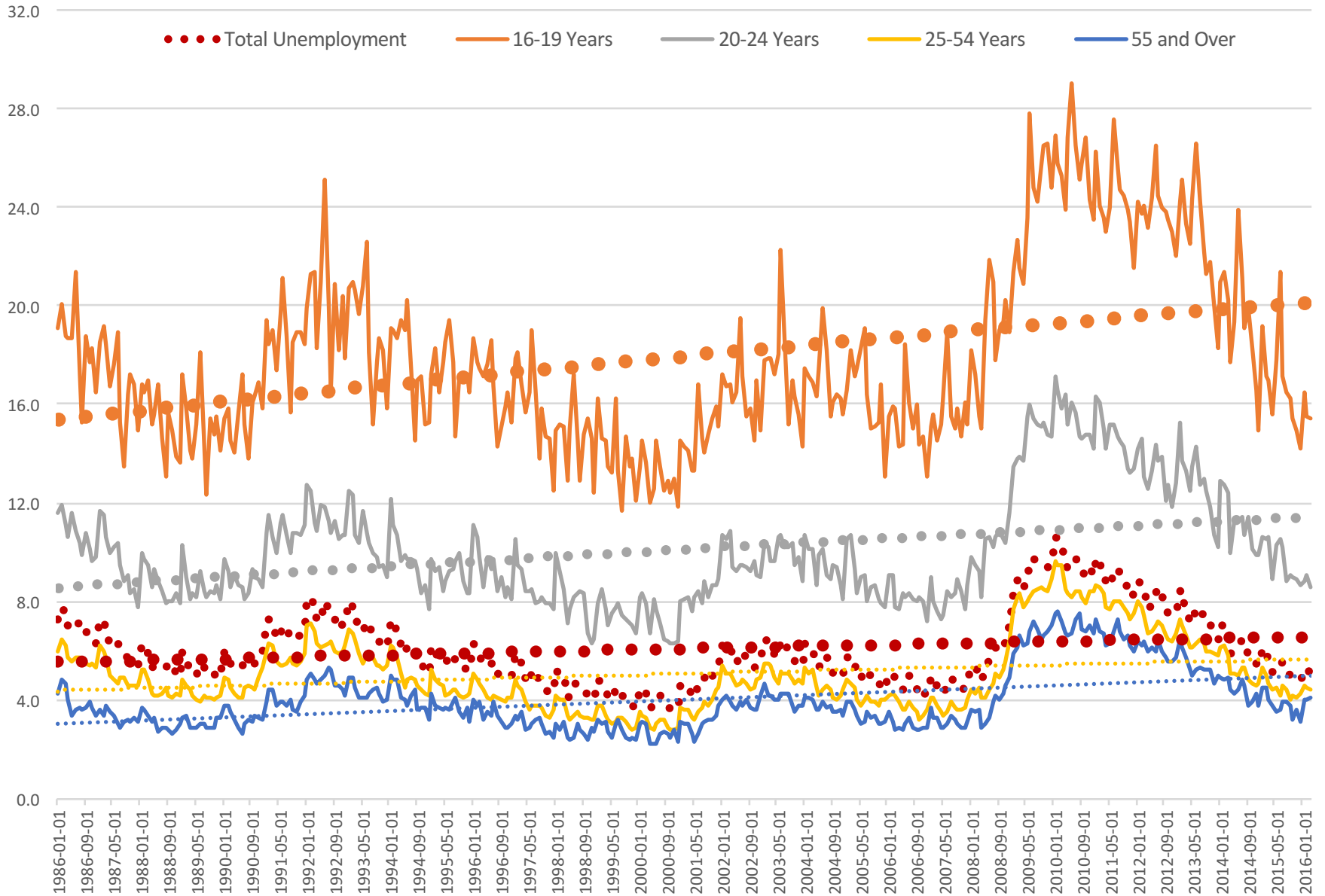
It Used To Be This



But Now It Is This

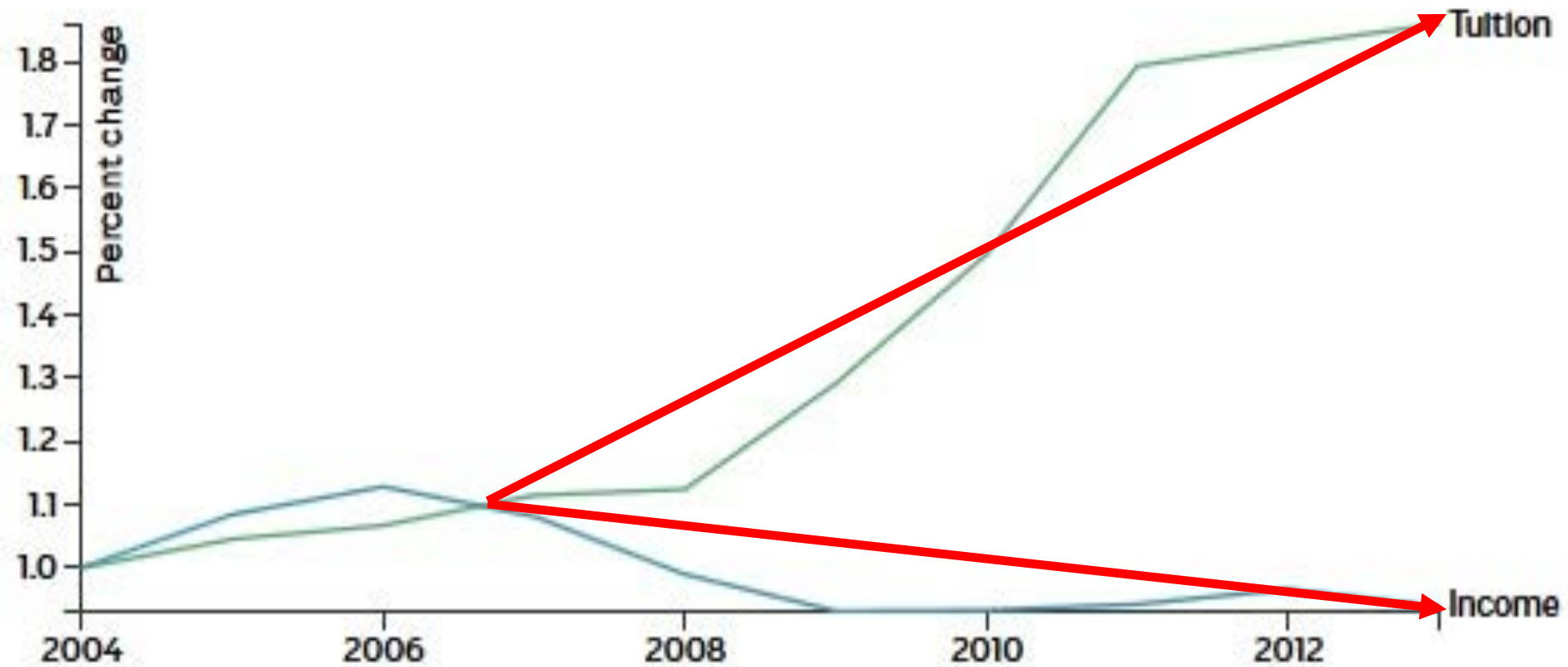


Some Hit Harder Than Others

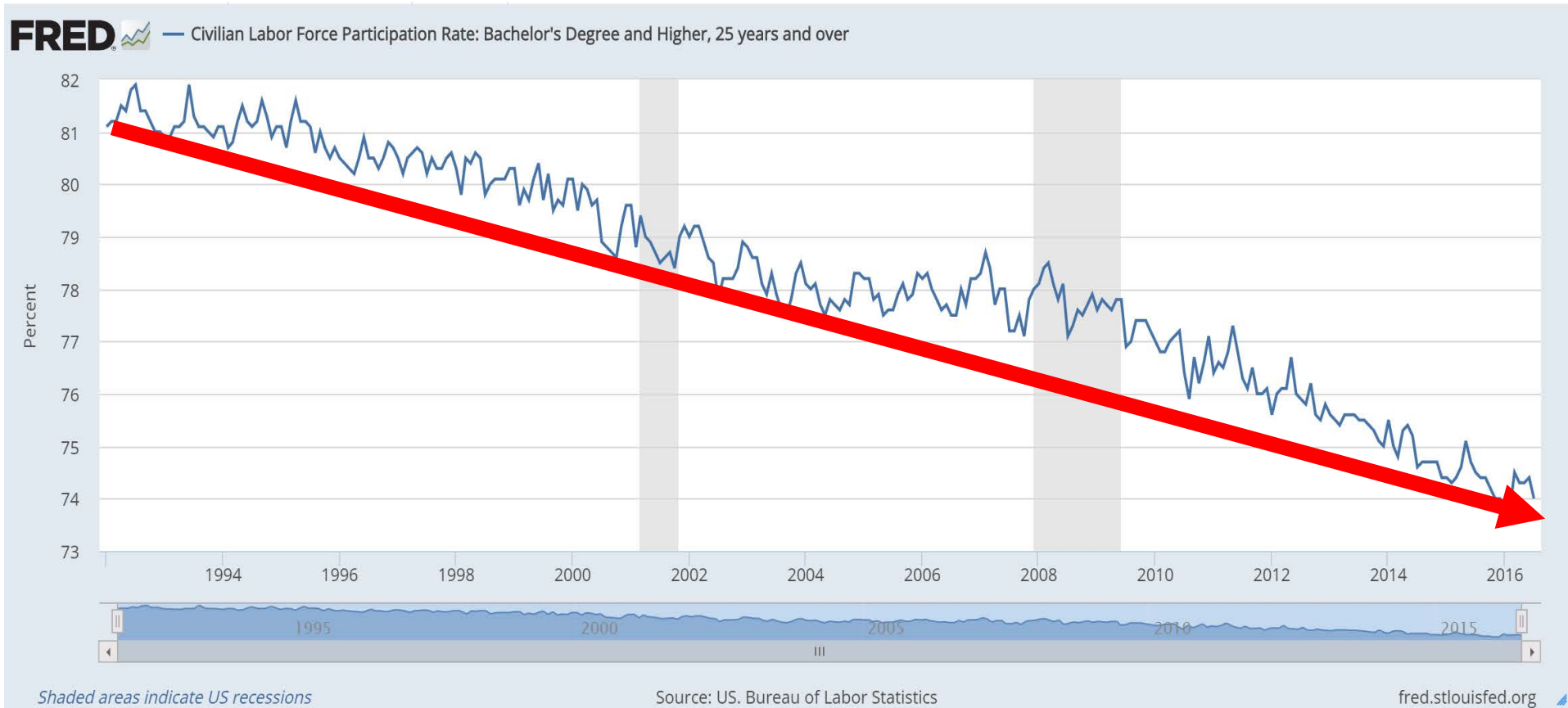


Revenue Vs. Expenses

- This does not equate

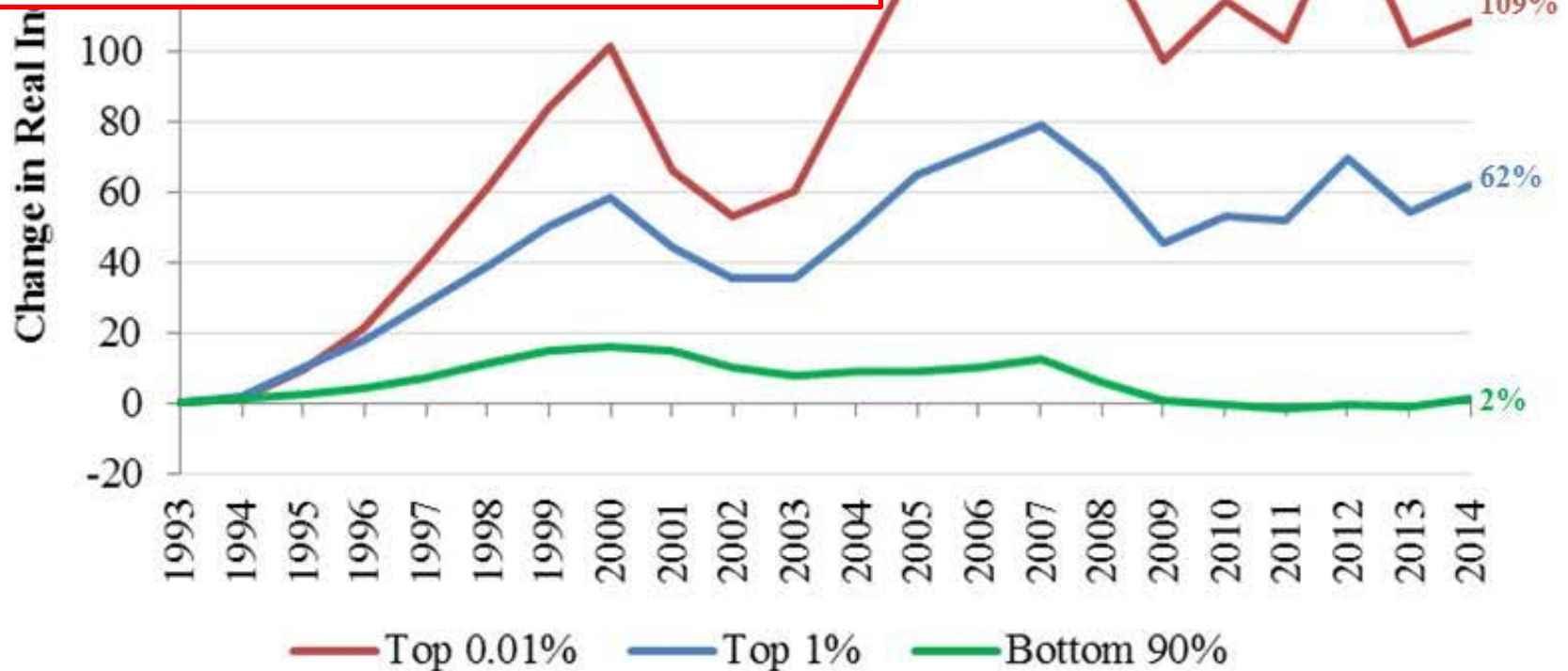


ROI?



Exploding Income Inequality

What could possibly happen from here that no one saw coming?



Note: Adjusted for inflation. Excludes capital gains.
Source: Piketty and Saez

THIS Could Happen

People
feeling the
pinch will
vote for
change

Even if that
change is
not going to
work...



What does this have to do with cyber security?

Everything.



**No job, too
much debt...**

**Somebody's
got to PAY...**

Michael Curry @mcurryfelidae07 · 2h

Remember: Mike Brown was assaulted & murdered by an officer
because he was jaywalking. #pumpkinfest #WhitePrivilege

Reply Retweet Favorite

**Keene, NH
Not
Ferguson...
Milwaukee...**



Why Take On This?



Reuters

When you can do this?

From the Comfort of Your Favorite Coffee Shop



**Knowledge Is Free.
We Are Anonymous.
We Are Legion.
We Do Not Forgive.
We Do Not Forget.
Expect Us.**



Think You're Dealing With a Few Geeks?

← → ↻ anonymous.hol.es

Anonymous Facebook page network

Each point (node) in the graph represents a Facebook page which is associated with Anonymous. If page A gives page B a "like", they become connected with a line. Node size represents the amount of 'likes' received from others in the network. Colors show different communities. Click on a node or find the page in the search field to see which pages it 'liked' ("outgoing") and from which pages it recieved a 'like' ("incoming"). The graph may take some time to load.

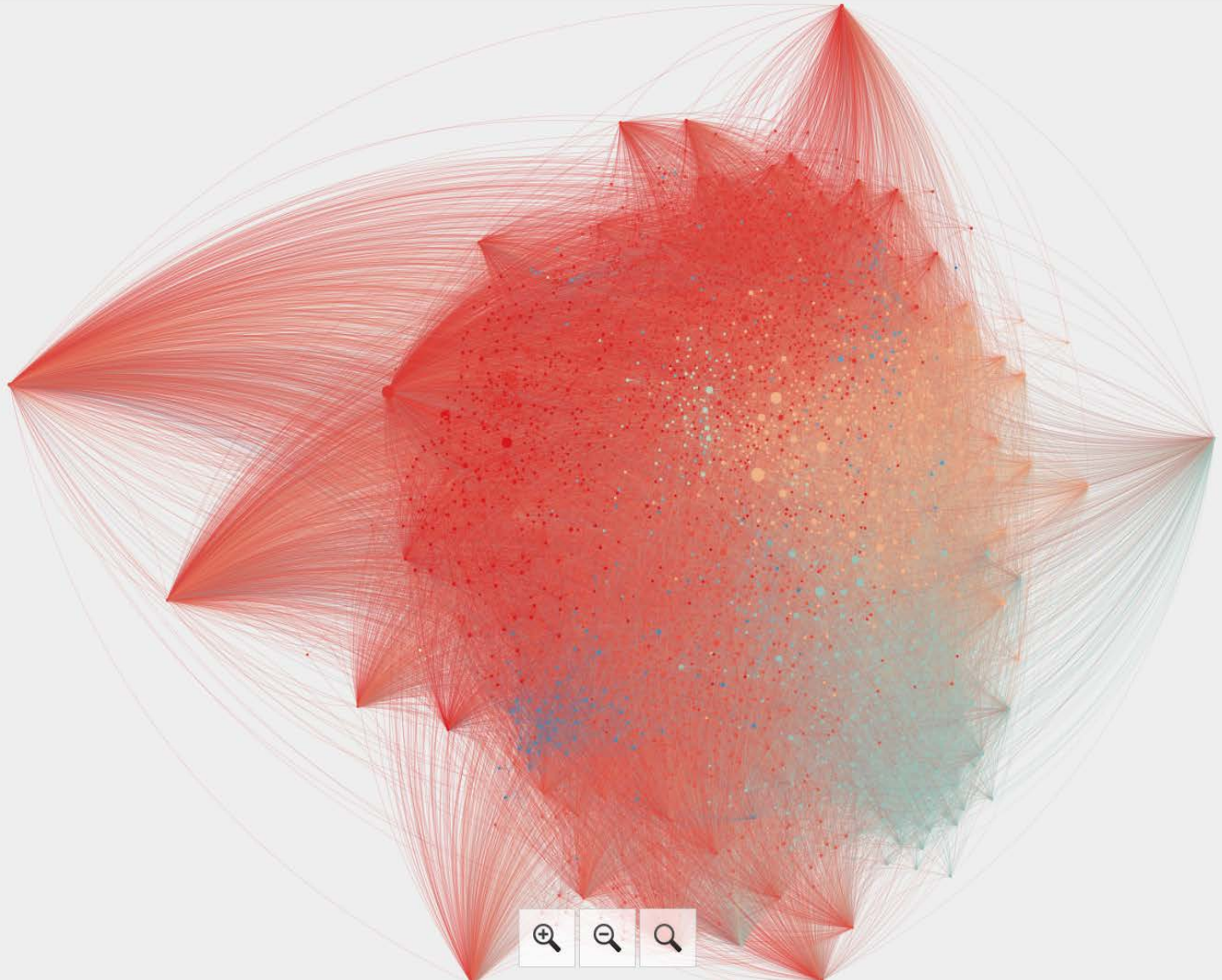
[i More about this visualisation](#)

Legend:

- Facebook page
- ↘ Like
- Community

Search:

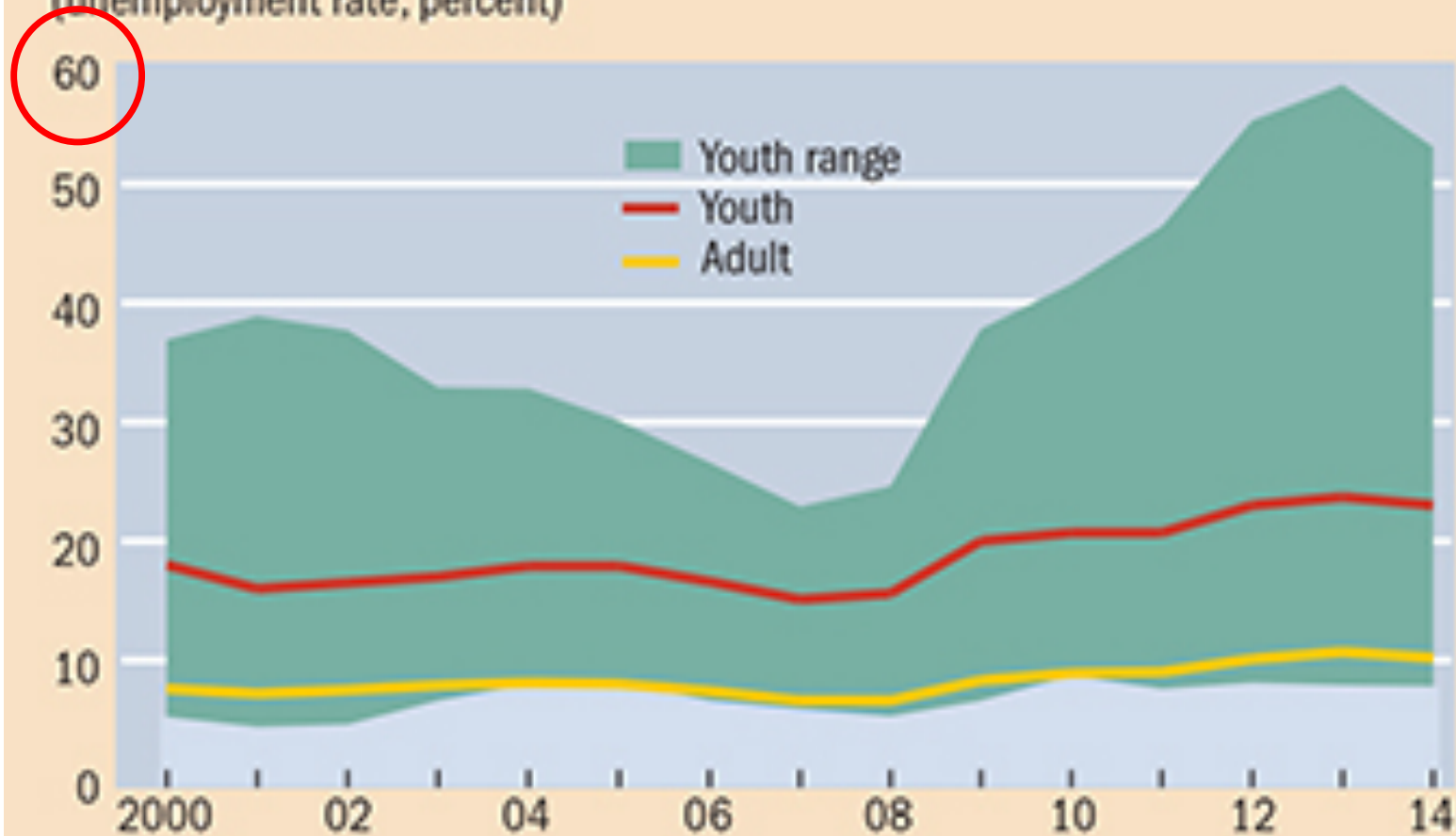
Search by name



A bleak picture

Youth unemployment in Europe runs about double that for adults; in some countries half the youth are jobless.

(unemployment rate, percent)



Sources: Eurostat; and IMF staff calculations.

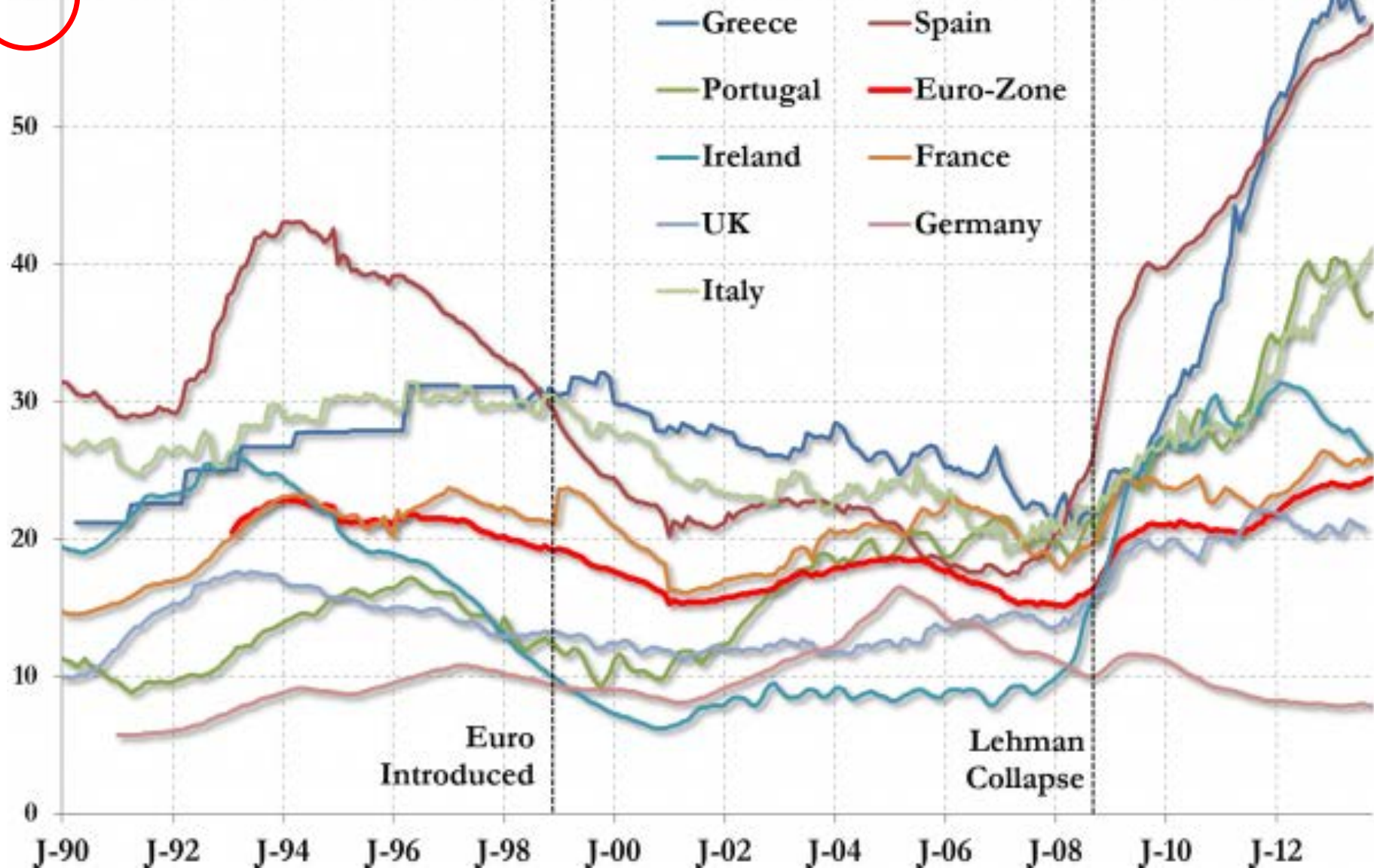
Note: Shading shows the range of youth unemployment rates in euro area countries.

Not Just Here...

“in some countries, half the youth are jobless”

European Under-25 'Youth' Unemployment Rates

60



The Cyber Toupee

When \$80 Billion is not enough...

- *Dan Geer, Peter Kuper*

(\$170 Billion Should Definitely Do it)



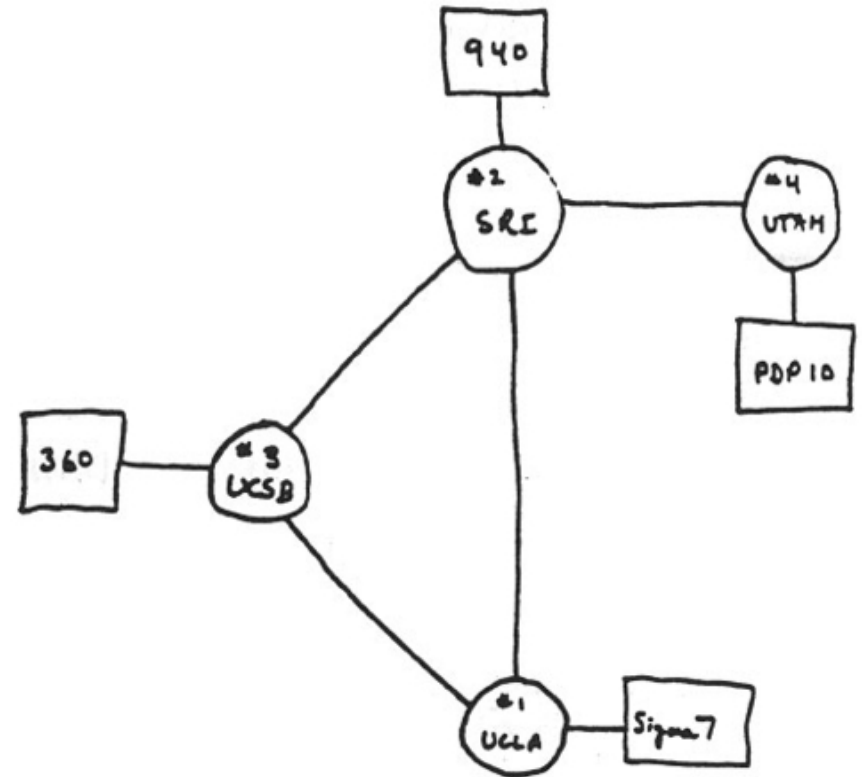
©hugh

The inherent openness of the Internet has created a problem we can not currently solve

From This...

Let's Share a Few Files!

Led to this...

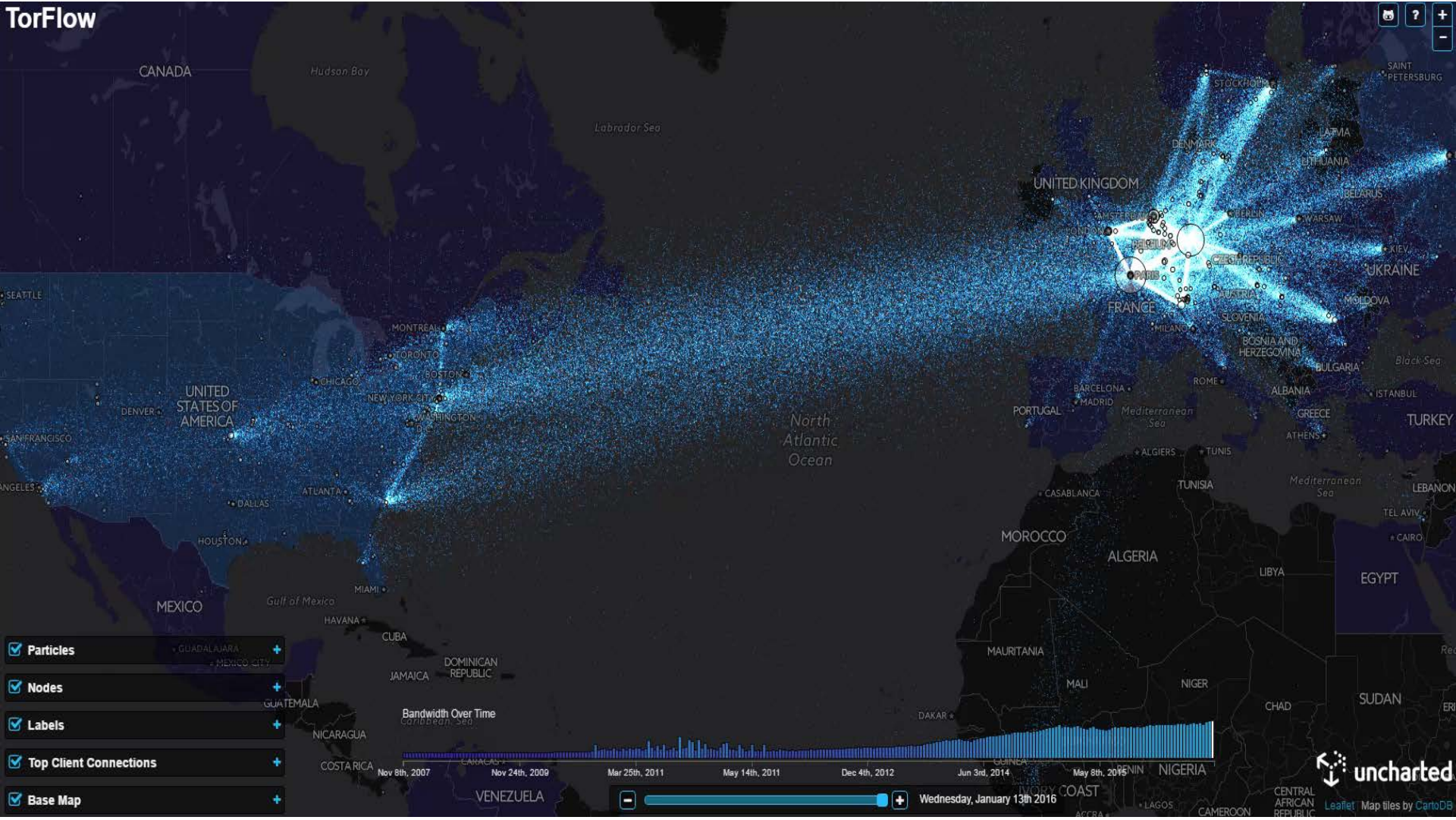


THE ARPA NETWORK

DEC 1969

4 NODES

To Defending Against This



\$170BN by 2020? Still Not Enough

Record, Rapid Spend

World-wide Cybersecurity Market (Gartner)

CAGR 9.8%

\$75.4B

\$170B

2015

2020

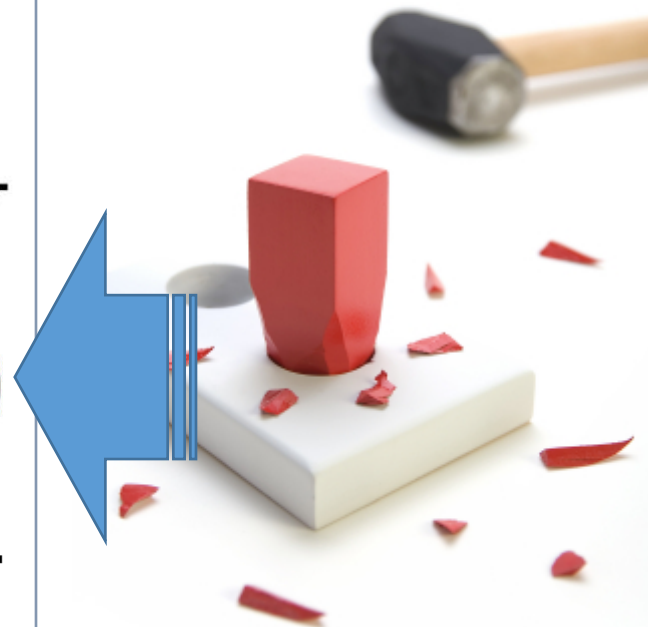
Unmitigated Failures



SONY



Legacy Security Approaches



An Unrelenting Adversary

AT&T Cybersecurity Insights Report

- 458% increase in search for IoT vulnerabilities

Dell Security Annual Threat Report

- Malware attacks doubled to 8.19B

IBM X-Force Cyber Security Intelligence Index Report

- 60% of all attacks suffered by IBM customers were carried out by 'insiders'

Symantec Internet Security Threat Report

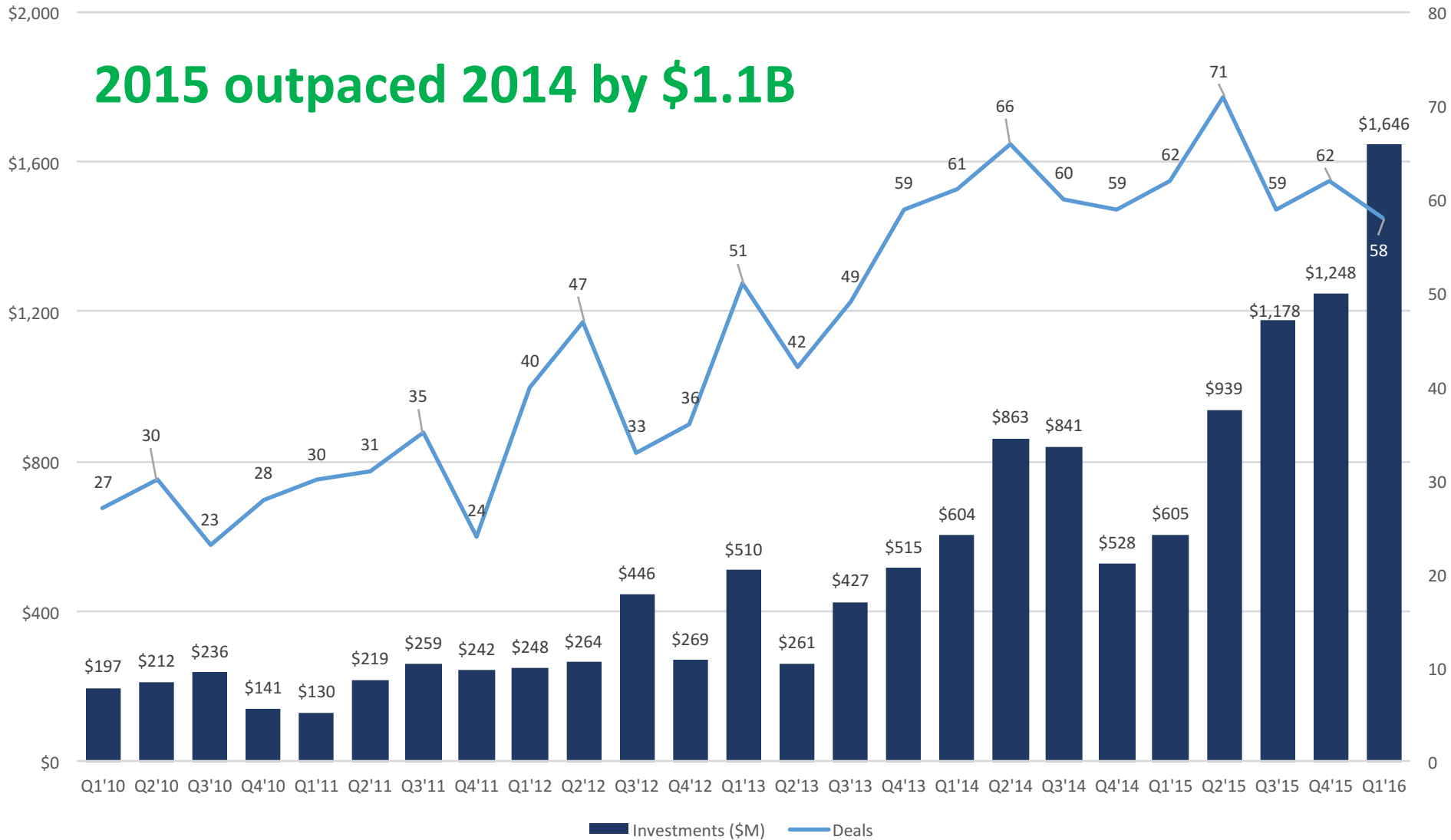
- 55% increase in spear-phishing campaigns

Verizon Data Breach Investigation Report

- 89% of all attacks involve financial or espionage motivations

VCs Love Cyber

2015 outpaced 2014 by \$1.1B



Source: CB Insights, Momentum Partners

No Shortage of Choices

Network & Endpoint Protection



Logging & Monitoring



Authentication & Identity Management



Security Operations



Cloud Security



Security Analytics



Threat Intelligence



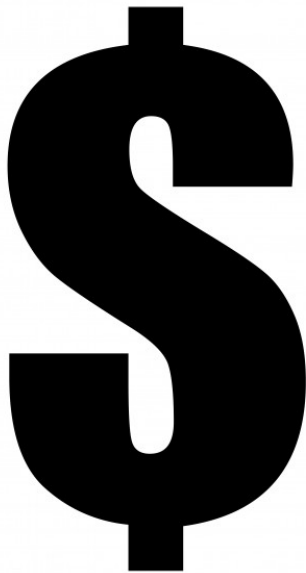
Information Security



But, Is There Really a Choice?

Still Getting Owned:

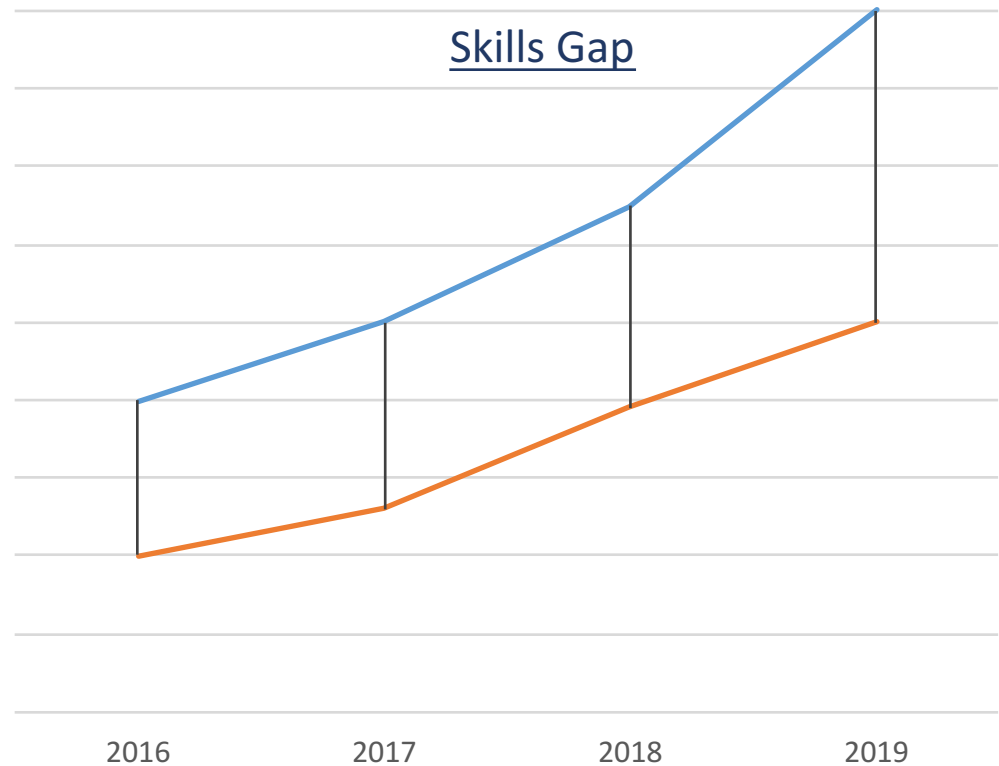
Cost of Cybercrime



Over \$2 trillion
by 2019

With Less Resources:

Skills Gap

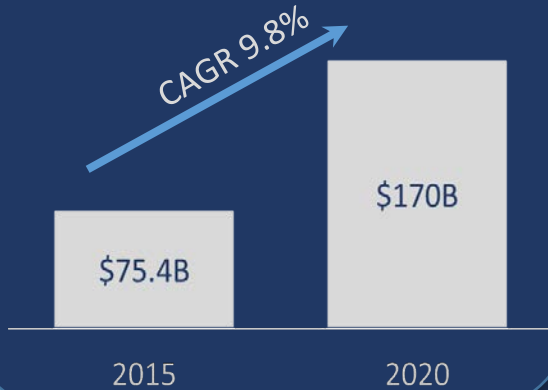


Shortfall by 1.5
million by 2019

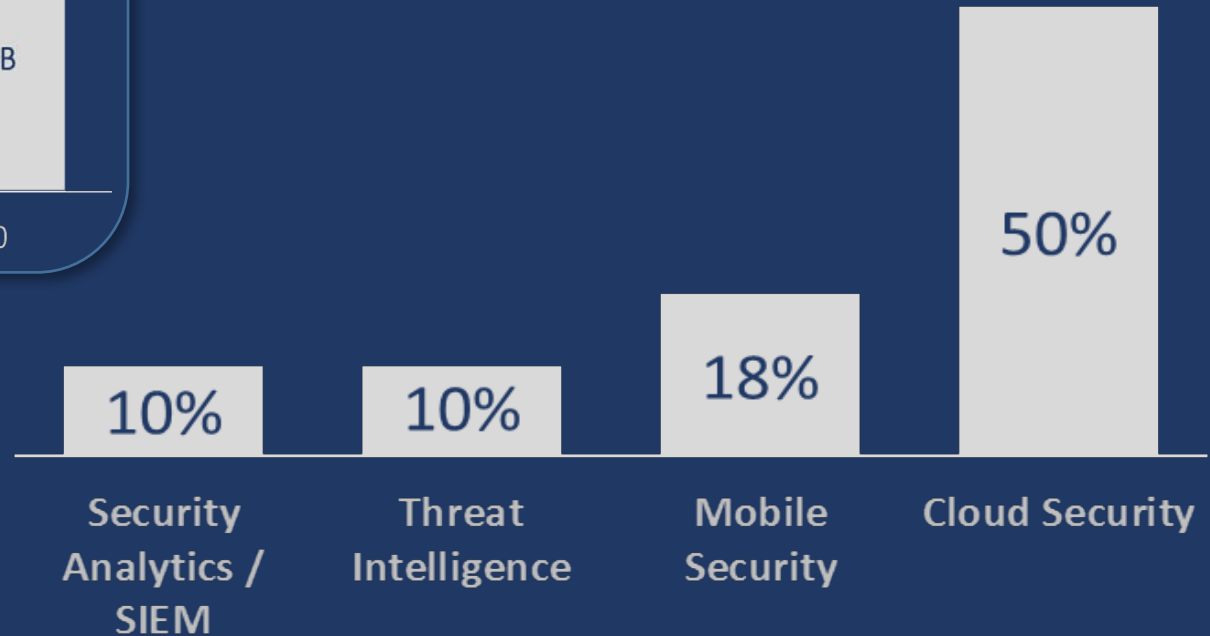
- Juniper Research Report 2016

Cyber Spend Highest for Outsourced Services

World-wide Cybersecurity Market (Gartner)



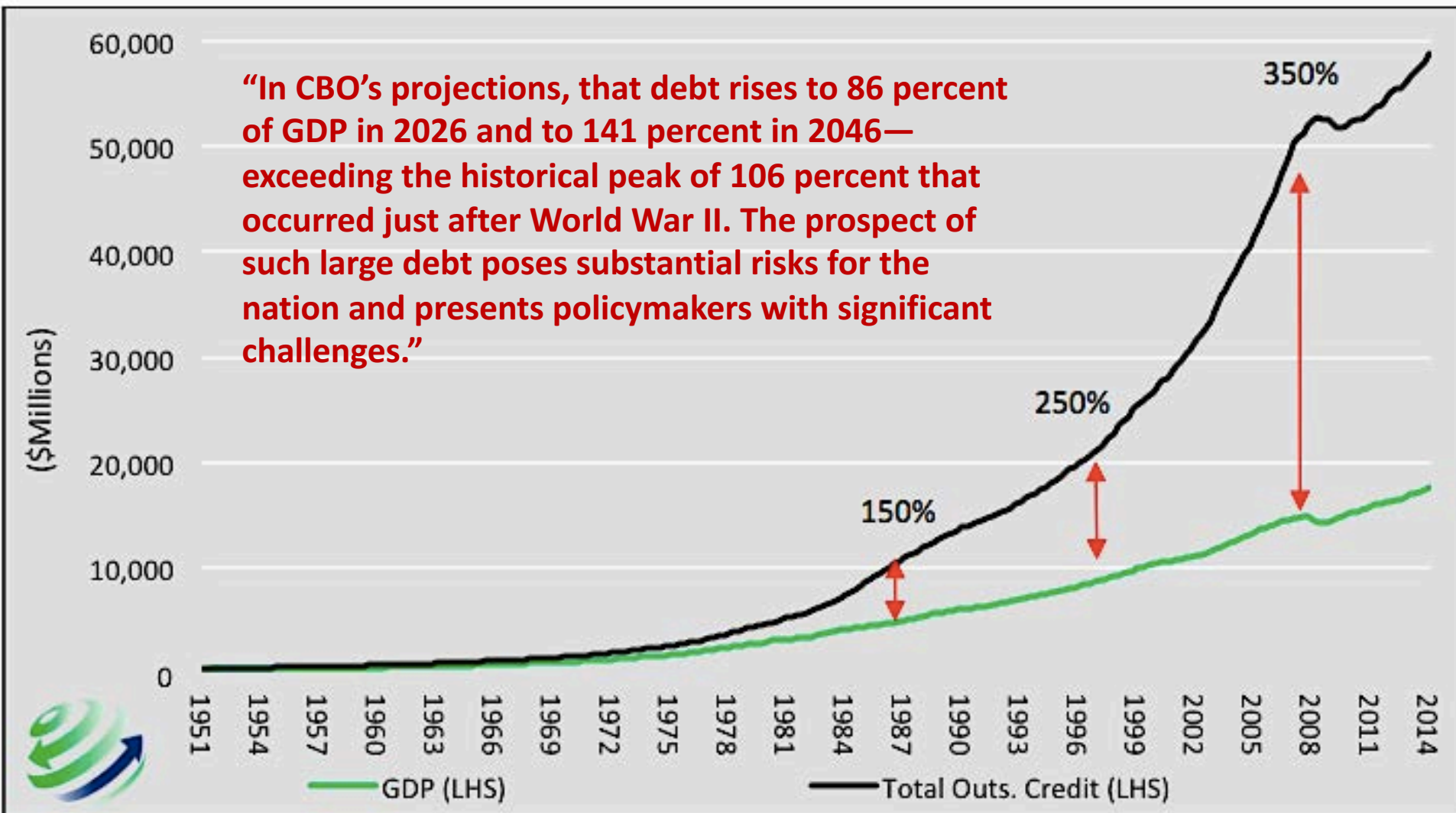
IDC's Hot Areas (% Growth)



Just one little issue...

And \$ Will Be Harder to Find – Define Unsustainable

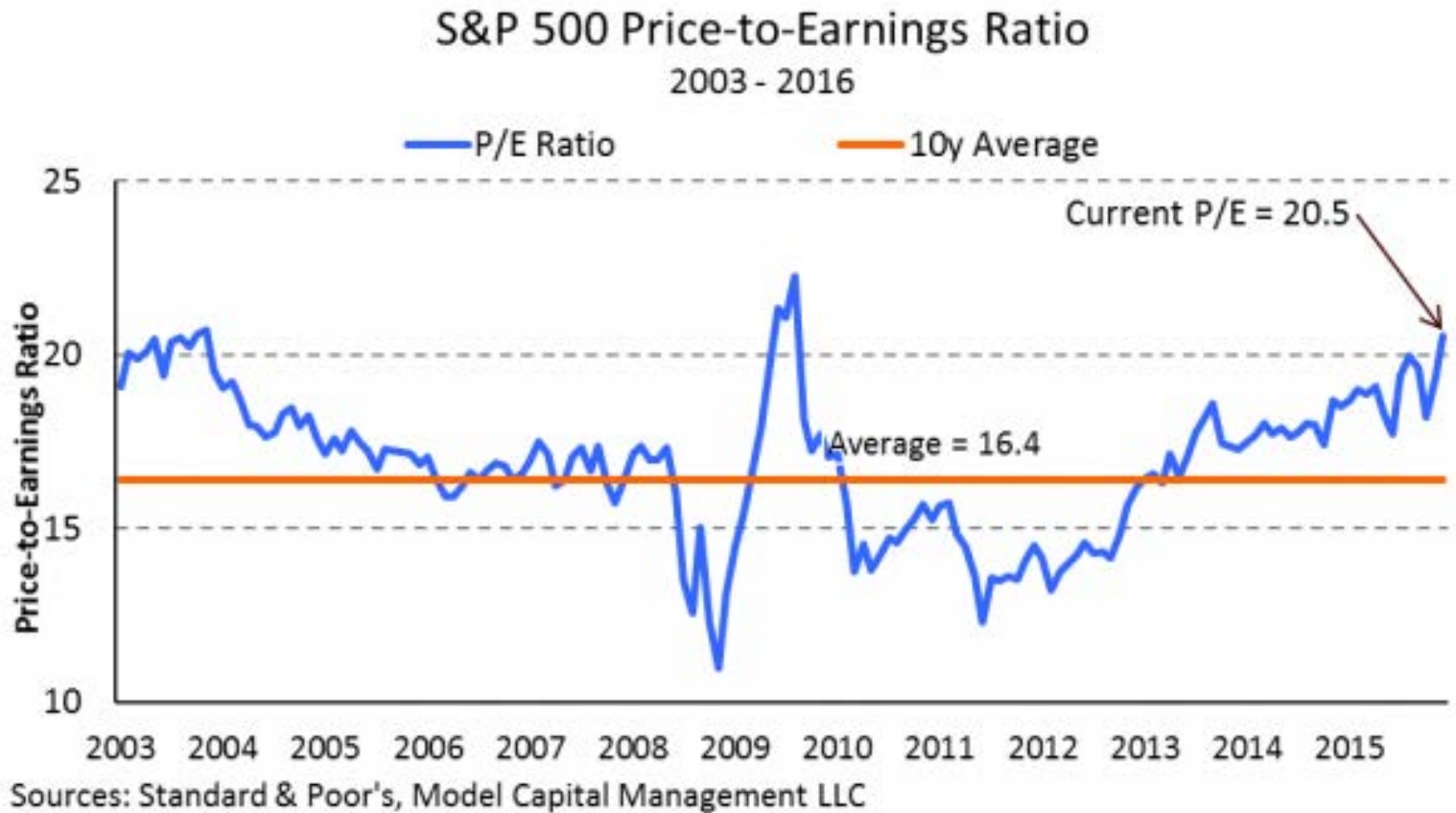
Total Domestic Outstanding Credit vs. U.S. GDP



Data Courtesy: Bloomberg. St. Louis Federal Reserve

Stock Prices Need EPS to Stay Afloat

If revenues fall, expenses will too...



Meanwhile, Market Catalysts Run Unabated...



**Mobile
Workforce**



SaaS First



**Shift to Public &
Hybrid Cloud**



Globalization



Agile-Ops



Elastic Scalability



Commoditization

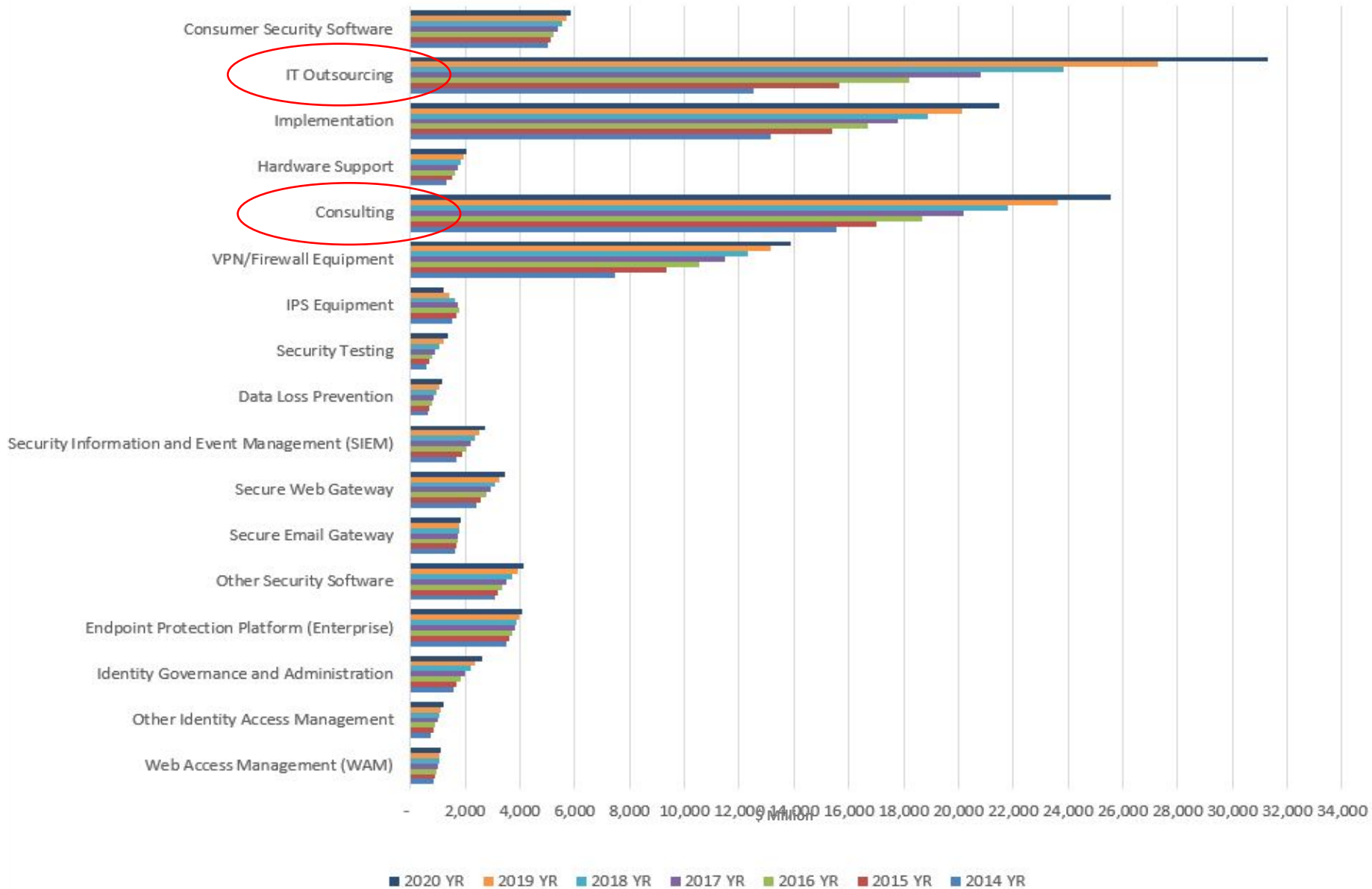


**Software Defined
Infrastructure**

While Attacks Evolve, Shift to Exploit Unabashed

- Malware is morphic
 - Signatures are essentially useless here
 - As are sandboxes
- And hundreds of billions of cumulative investment have failed to win the war
- We must incorporate new approaches
 - Outsource
 - Crowdsource
 - Other collective/predictive efforts are severely underutilized

Forecast IT Security Spend by Category Supports Our View



Source: Forecast: Information Security Worldwide 2014-2020 1Q16 Update - Gartner

GAME Theory: Strength in Numbers

- Don't Fight Battles, Win the War
 - You are not going to win this alone
 - Don't even bother thinking other wise...
- Strength in critical mass means outsourcing
 - Google, Amazon, Microsoft and others will always have more resources than any one organization
- Defending the real perimeter – the ENDPOINT – is where the direct efforts should be made
 - Servers, Desktops, Laptops, Tablets, Smartphones are all accessing the data so focus there

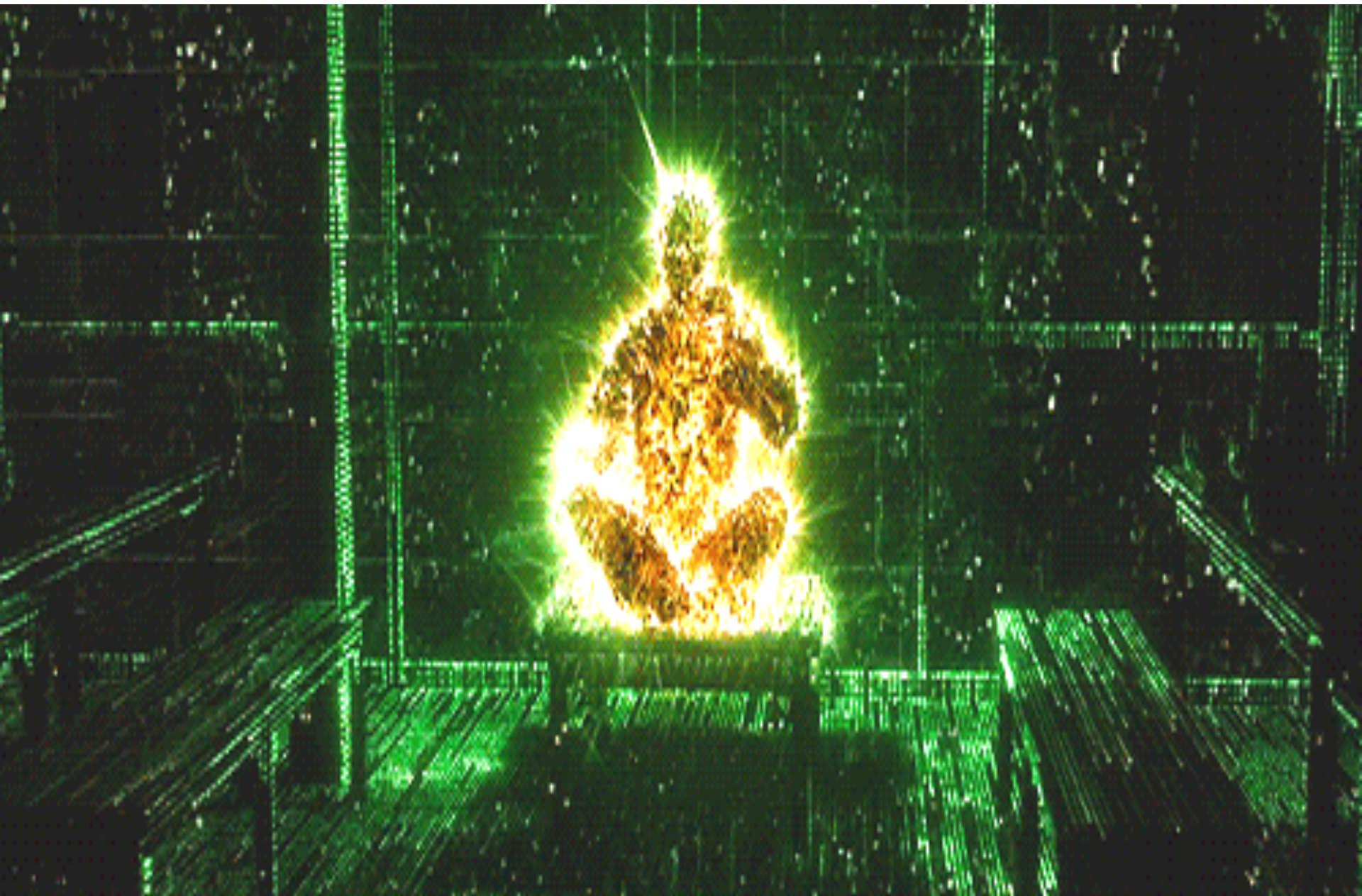
The GAME is Already Afoot! (And Years Underway)

- Google
 - Postini \$625MM acquisition 2007
 - Virus Total Acquisition 2012
 - Google Poaches Sophos CTO Gerhard Eschelbeck (Nov. 2014)
- Amazon
 - Going early stage: part of \$45MM investment in Ionic Security (2016)
 - Recent job post: “We dive deep into security technologies such as new authentication systems, hardware security components, cryptography, system hardening, and massive-scale audit analysis.”
- Microsoft
 - Billions in cyber acquisitions since 1999
 - Microsoft Invested \$1 Billion In 'Holistic' Security Strategy (2015)
 - Cyber Defense Operations Center (2016)
- Endpoint – Focus Your \$\$ Here...the big guys have BILLIONS elsewhere

If You Think You Can Win the War...

You ain't seen nothing yet...

It's a Brave New World Out There



It Used To Be This



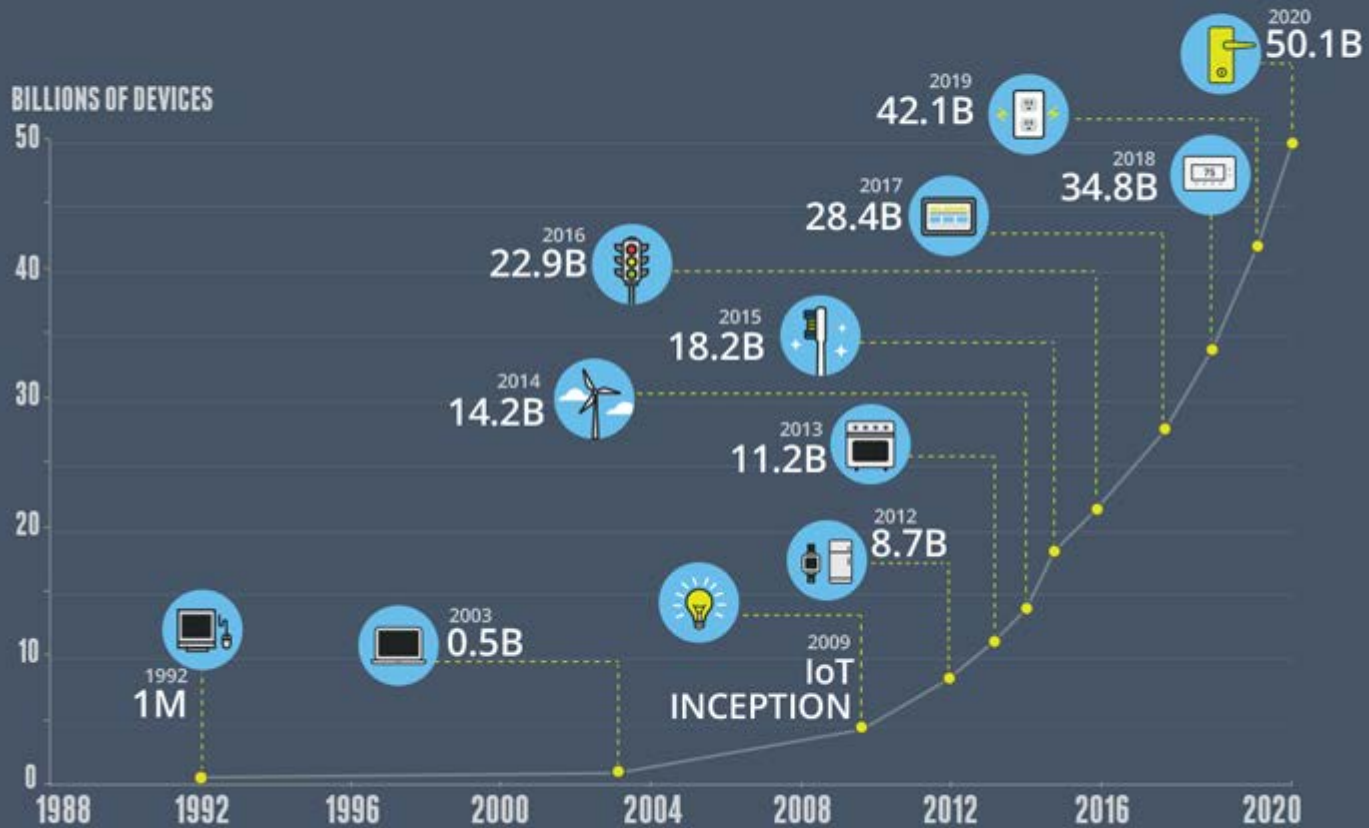
But Now It Is This



IoEverything

GROWTH IN THE INTERNET OF THINGS

THE NUMBER OF CONNECTED DEVICES WILL EXCEED **50 BILLION** BY 2020



All Together Now - \$30 TRILLION!!

	Potential Economic Impact (\$ Trillion, Annual)	
Disruptive technology	Low	High
Automation of knowledge work	\$5.2	\$6.7
Advanced Robotics	\$1.7	\$4.5
Autonomous vehicles	\$0.2	\$1.9
The Internet of Things	\$2.7	\$6.2
Mobile Internet	\$3.7	\$10.8
Total	\$13.50	\$30.10

Source: McKinsey Consulting

BTW – This Is A Very Good Thing

- Technology has led to amazing advancements for the human race
- And, in general, the world
- Embracing the change is the only play

It Used to Be This



Jacob Cox-Brown

2 hours ago · 🌐

Drivin drunk... classsic ;) but to whoever's vehicle i hit i am sorry. :P



But Now It Is This (Almost...)



It Is Only A Matter of Time



About That Time...

- Rio Tinto has started using automated, driverless trucks to move iron ore in its Pilbara mines, controlled from an operations center 1,200 kilometers away in Perth.



>\$500MM a Year Getting Poached, TODAY

“Studies estimate that the Internet economy annually generates between \$2 trillion and \$3 trillion, a share of the global economy that is expected to grow rapidly.

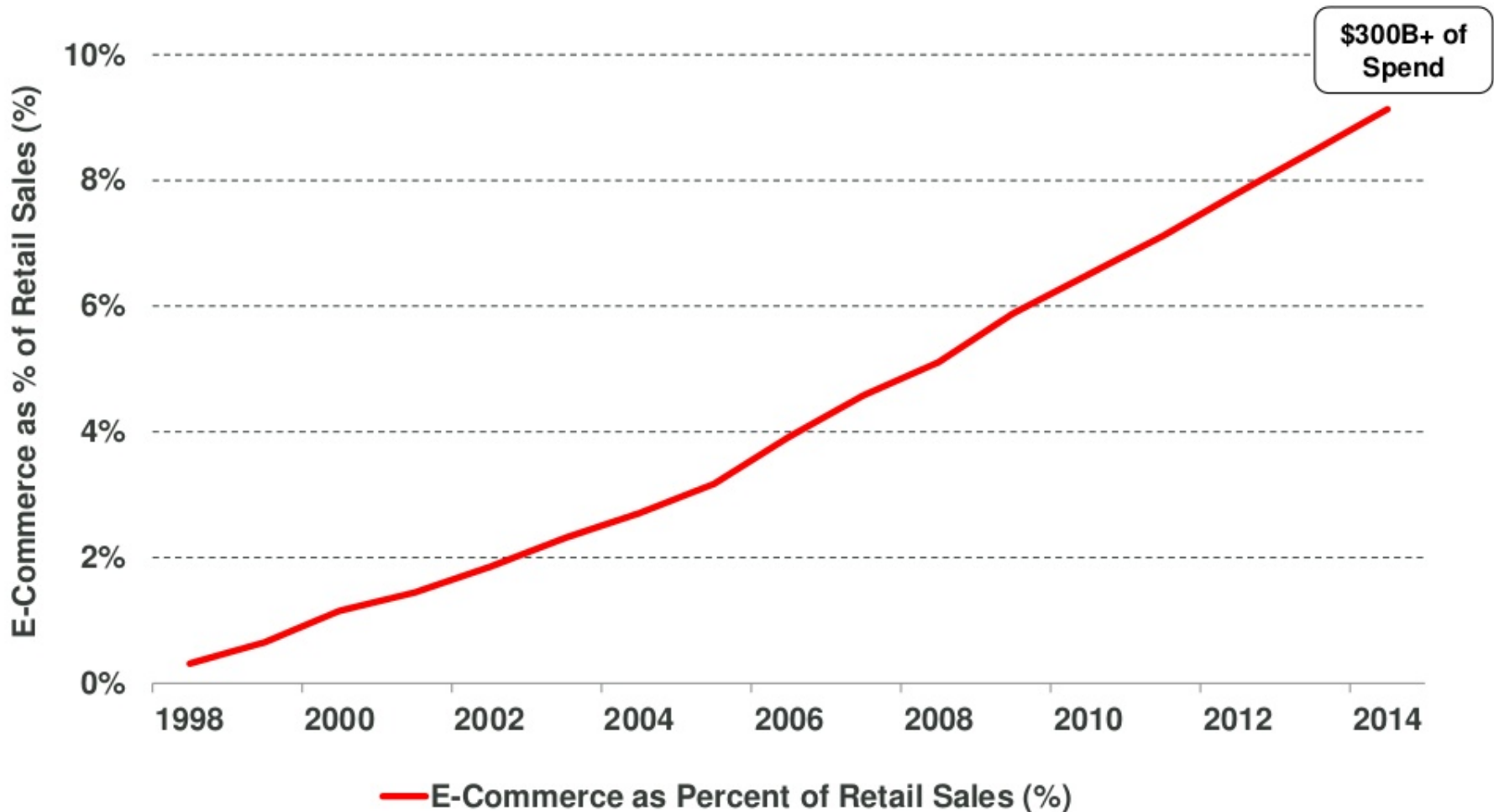
If our estimates are right, **cybercrime extracts between 15% and 20%** of the value created by the Internet.”

Juniper Research predicted that losses from data breaches to **reach \$2.1 trillion globally by 2019**, increasing to almost four times the estimated cost of breaches in 2015.

Source: Center for Strategic and International Studies, June 2014, Juniper 2016

Commerce via Internet Up Dramatically = @ 9% of Retail Sales vs. <1% in 1998

E-Commerce as % of Total Retail Sales, USA, 1998 – 2014



Physical Device, Online Purchase

BTW – online reservations > 276,000 within 72 hours



Elon Musk @elonmusk · Apr 1

Model 3 orders at 180,000 in 24 hours.
Selling price w avg option mix prob \$42k,
so ~\$7.5B in a day. Future of electric cars
looking bright!

🔄 19K ❤️ 23K ⋮

...And rumored to be over 400,000 currently

THIS Needs To Happen:

- Simply put, there is too much at risk for Cyber Security to remain a losing proposition
 - And it will only increase over time
- Innovation, Investment is our ONLY way out of this mess
- Mess = >\$6 Trillion in theft

IN 60% OF CASES,
ATTACKERS ARE ABLE
TO COMPROMISE AN
ORGANIZATION
WITHIN MINUTES.

Verizon DBIR 2015

And That's Problematic Because...

EVERYTHING

of value is already online in one form
or another

And we better start concentrating on
where the real crime is growing

So,
Where Do I
Focus???

Main Focus Areas – Things You Can Control



Digital Intelligence

*Determine what it **is**, what it's **doing**, if I **care**, and what I should **do** about it.*

Market Trends

- Cyber Discovers Math
- Honeypots Rebooted
- Digital Discovery
- Automation

Challenges

- Situational (un)Awareness
- Data Explosion
- Internet of Everything



The computer is here to stay, therefore it must be kept in its proper place as a tool and a slave, or we will become sorcerer's apprentices, with data data everywhere and not a thought to think.

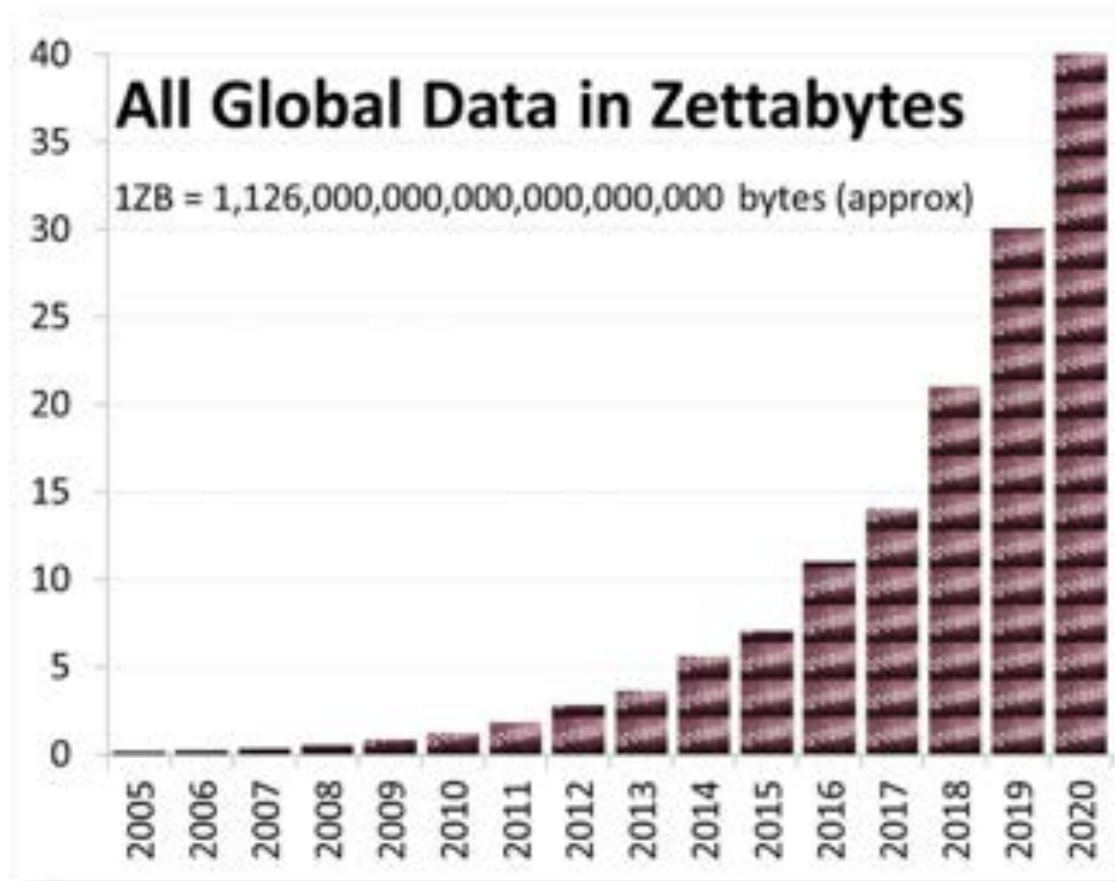
— *Jesse Shera* —

AZ QUOTES

Data Deluge, But Little Real Information

- Data is a means to an end
- Actionable information is what matters
- Define: Actionable?

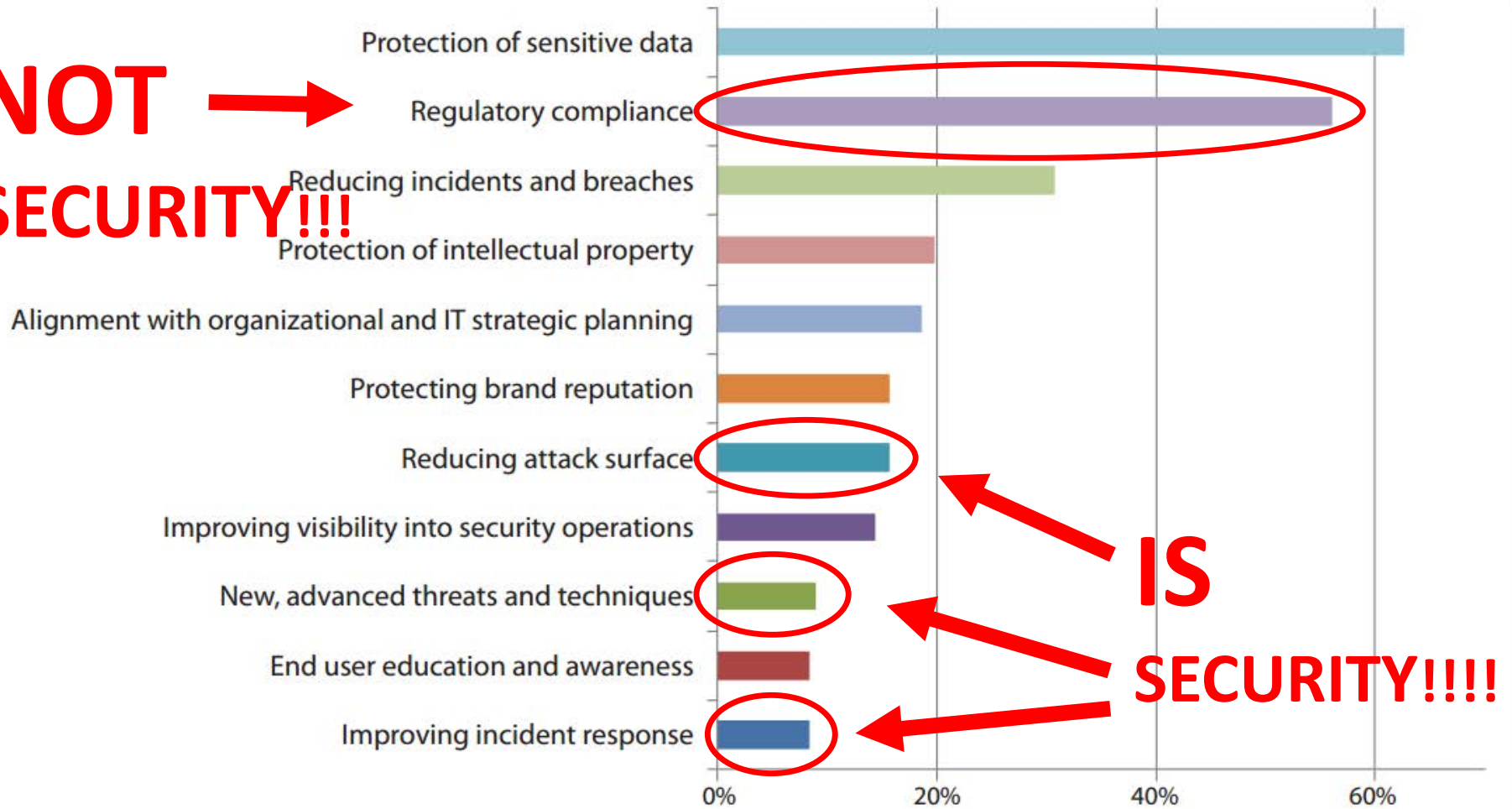
- Situational (un)Awareness
- Data Explosion
- Internet of Everything



Actions? Mostly All The Wrong Places

What are the most significant drivers behind your spending on information security?

NOT →
SECURITY!!!



IS
SECURITY!!!!

2016 SANS Data

ROA

Return On Assets?

- Actually:

- Reduce Attack Surface

- Focus on Key attack vectors

- Outsource Everything

- Open Source/Commoditize all else

- Automate Wherever Possible

- Augment automation with Intelligence



Reduce Attack Surface



1. Reduce Attack Surface Area

- Cybercrime (25.1% (DBIR Attacks): Close the window!
 - Web Browser – why let “stupid” roam wild?
 - Hosted browser ideal (an AWS-like baby-step)
 - At least DOM strip
 - Endpoint - AV is DEAD... Finally
 - See: Cyance, CounterTrack, Confer, Digital Immunity, etc.
 - See incumbents promoting everything other than sigs
- Insider Misuse (20.6% DBIR Attacks): SIEM meets BI
 - Model patterns in real time for proactive defense, not forensics
- But Where is YOUR Spend actually going?

The Endpoint is The Perimeter

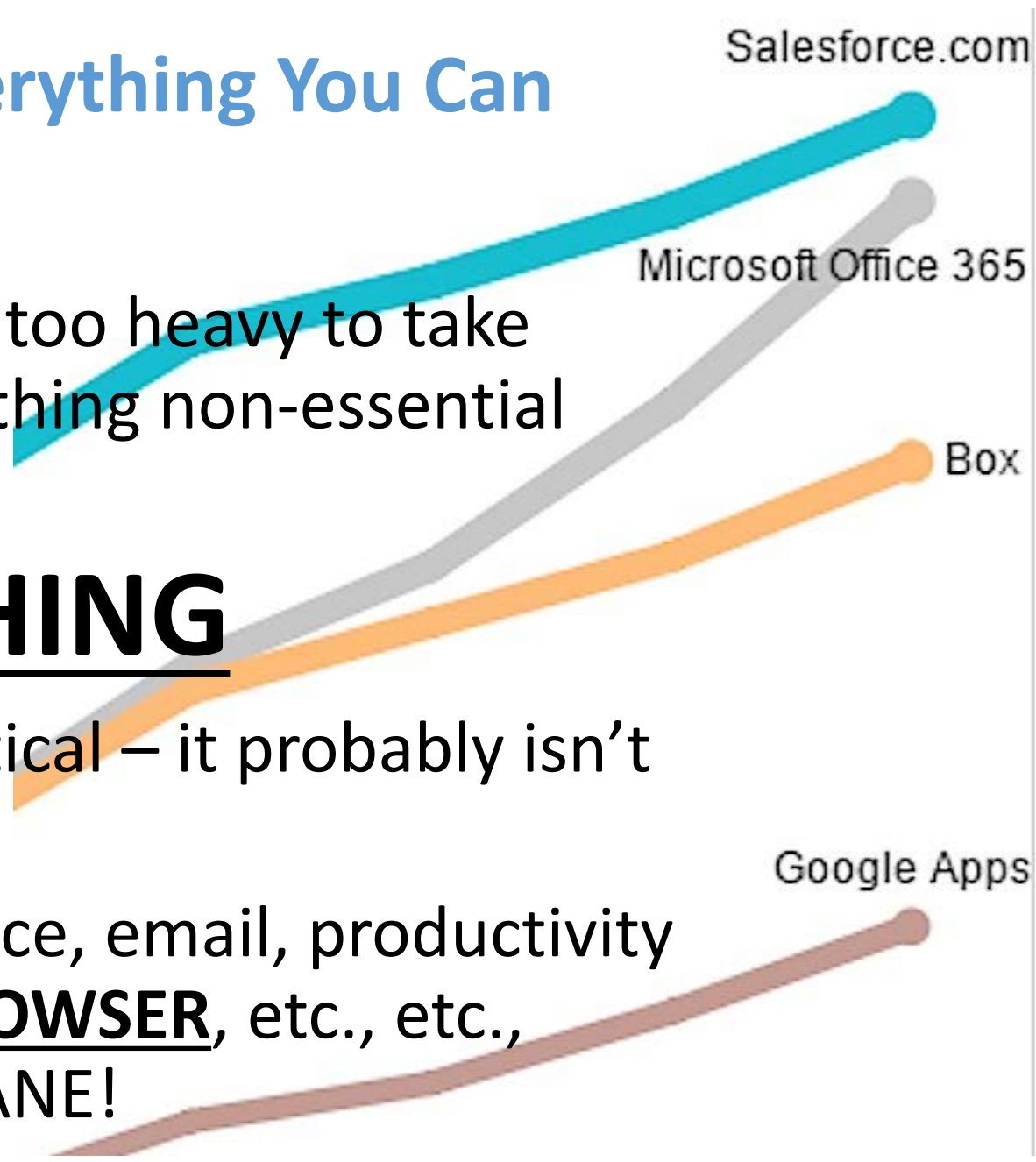
- It's where the data is accessed so focus there
- Over \$1.5BN raised by endpoint providers in the past 12 months
 - Tons of \$\$ to propel innovative approaches gives organizations a fighting chance
 - Just last month, Cylance raised \$100mm on a \$1BN Valuation
- Frenzy of investment gives buyers a competitive advantage
 - Private companies desperate for growth
 - Meanwhile, incumbents petrified of customer attrition
 - Advantage YOU!
- I'll say it again, **ADVANTAGE YOU**

Outsource Everything



2. Outsource Everything You Can

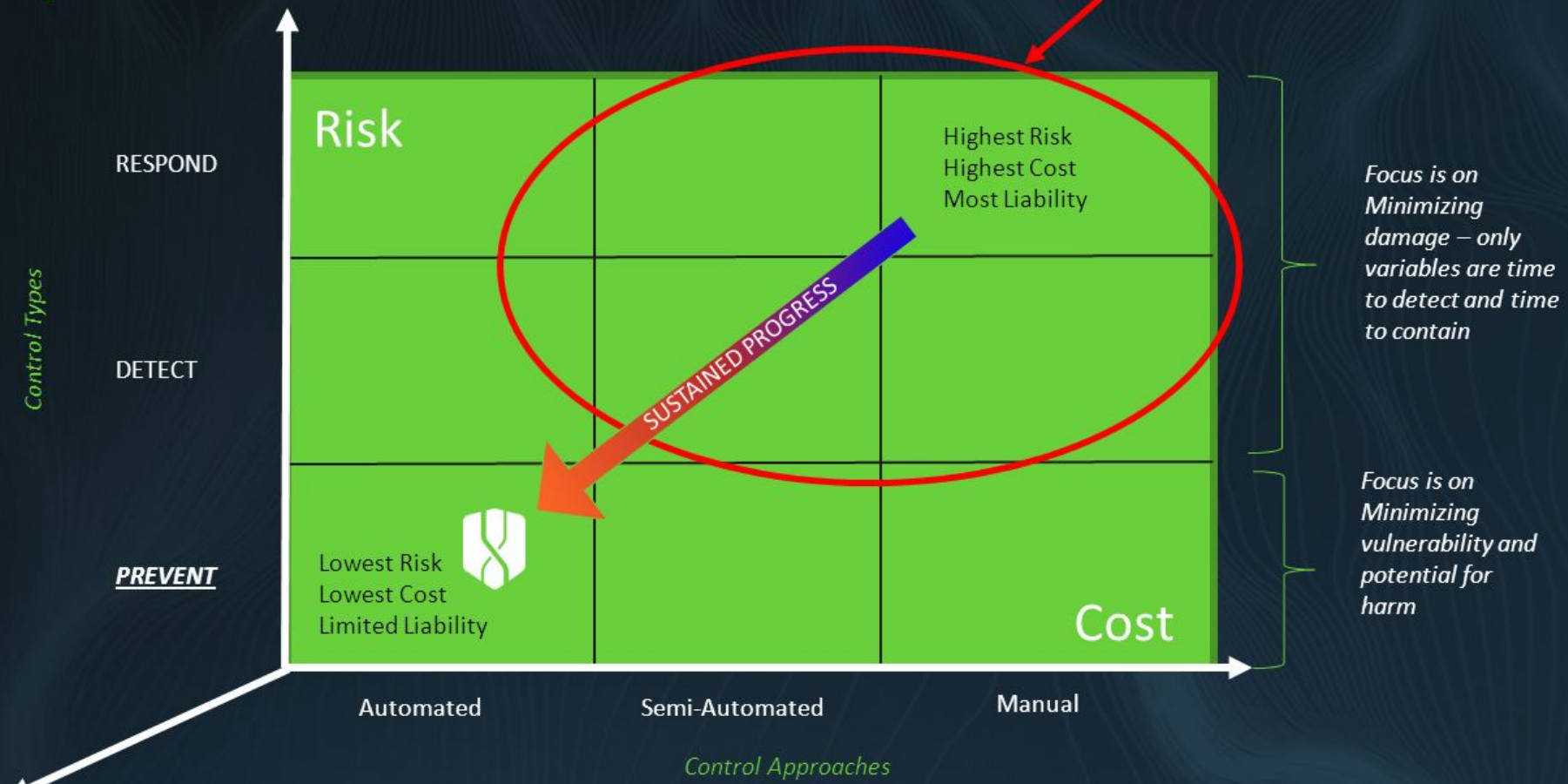
- Like a plane that is too heavy to take flight, throw everything non-essential out the door
- Yes, **EVERYTHING**
- Define Mission Critical – it probably isn't what you think
- HR, CRM, Back Office, email, productivity suites, BI, **WEB BROWSER**, etc., etc., etc..... OFF THE PLANE!



Automate Wherever Possible



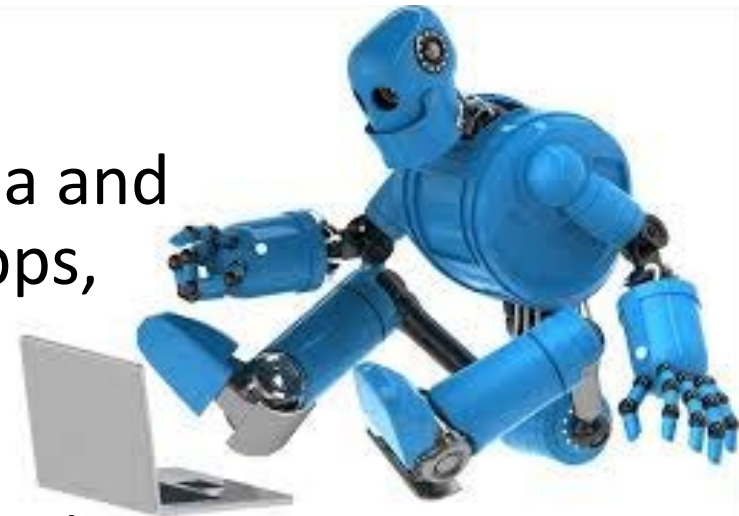
Risk vs. Cost



Source: Upcoming Release of Managing Risk and Information Security 2nd Edition – Malcolm Harkins

3. Automate Everything Else

- After reduced the attack surface area and outsourcing of the vast majority of apps, automation is required
- **BLOCK**, then investigate...
 - If you aren't willing to automatically block suspicious activity, you can not possibly win
 - AI/ML, Threat feeds and other drivers for sound automated
 - You (humans) can not compete so don't even try
- Insider Threat applies here too
 - Things change... and you can't keep up with everything so, again, don't try



3.1 Augment With Intelligence

Don't Be The Last in the Know



Most Useful Application?



Fans: 23 Yards per Play
Coaches: 1.67 Yards per Play

Actionable Intelligence and The Wisdom Of Crowds

- This is not new...
 - 2006: IBM's "Innovation Jam" was attended by over 140,000 international participants and generated approximately 46,000 ideas
 - 2009: The Netflix Prize which asked the crowd to come up with a recommendation algorithm more accurate than Netflix's own algorithm offering a grand prize of US\$1,000,000 (Contest winner BellKor's Pragmatic Chaos team bested Netflix's own algorithm for predicting ratings by 10.06%.)
 - 2009: DARPA balloon experiment, where DARPA placed 10 balloon markers across the United States and challenged teams to compete to be the first to report the location of all the balloons. (MIT won the event, in less than nine hours)
 - 2012: Tag Challenge, funded by the US State Department, required locating and photographing individuals in 5 cities in the US and Europe within 12 hours based only on a single photograph.

But it is not without its issues, especially as it pertains to cyber



CENTRAL INTELLIGENCE AGENCY

THE WORK OF A NATION. THE CENTER OF INTELLIGENCE.

Report Threats

ر ع ب ع ر ب ي

Contact

Search CIA.gov...

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ع ر ب ي 中文 Français Русский Español More ▶

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Home » Library » Center for the Study of Intelligence » CSI Publications » Studies in Intelligence » studies » VOL. 50, NO. 4, 2006 » Using Prediction Markets to Enhance US Intelligence Capabilities

Using Prediction Markets to Enhance US Intelligence Capabilities

A "Standard & Poors 500 Index" for Intelligence

Puong Fei Yeh

In 2001, the Defense Advanced Research Project Agency (DARPA) started experimenting with methods for applying market-based concepts to intelligence. One such project, DARPA's Future Markets Applied to Prediction (FutureMAP) program tested whether prediction markets, markets in which people bet on the likelihood of future events, could be used to improve upon existing approaches to preparing strategic intelligence. The program was cancelled in the summer of 2003 under a barrage of congressional criticism. Senators Ron Wyden and Byron Dorgan accused the Pentagon of wasting taxpayer dollars on "terrorism betting parlors," and that "Spending millions of dollars on some kind of fantasy league terror game is absurd and, frankly, ought to make every American angry."

"Prediction markets can contribute to US Intelligence Community strategic and tactical intelligence work"

Americans need not have been angry about FutureMAP. It was neither a terrorism betting parlor nor a fantasy league. Rather, it was an experiment to see whether market-generated predictions could improve upon conventional approaches to forecasting. Since 1988, traders in the Iowa Electronic Markets have been betting with remarkable accuracy on the likely winner of the US presidential elections.^[1] Eli Lilly, a major pharmaceutical company, found that prediction markets outdid conventional methods in forecasting outcomes of drug research and development efforts.^[2] Google recently announced that it was using prediction markets to "forecast product launch dates, new office openings, and many other things of strategic importance."^[3]

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CIA #Museum Artifact of the Week: #OSS Machete

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Like Any Research, Controls Are Required

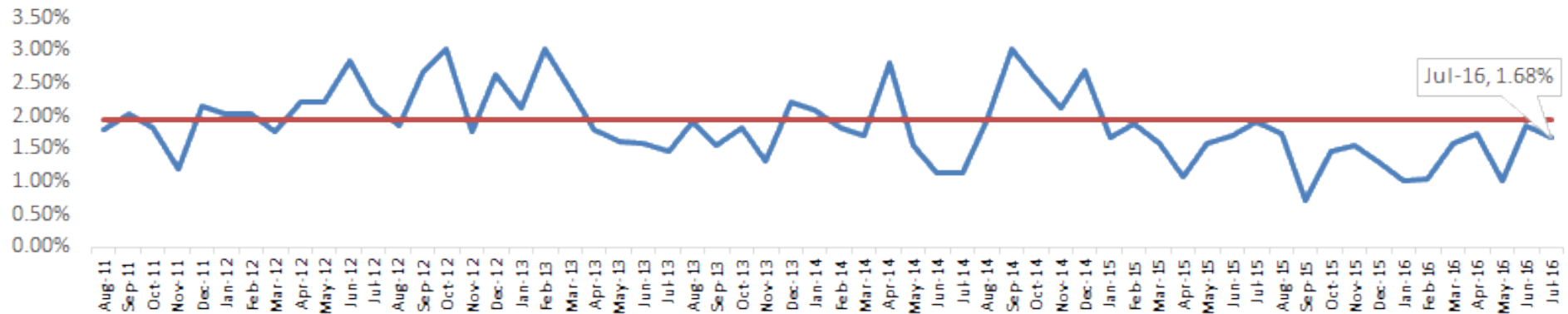
James Surowiecki, author of *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*, suggested three criteria to address gathering bias:

- Keep your ties loose.
- Keep yourself exposed to as many diverse sources of information as possible.
- Make groups that range across hierarchies.

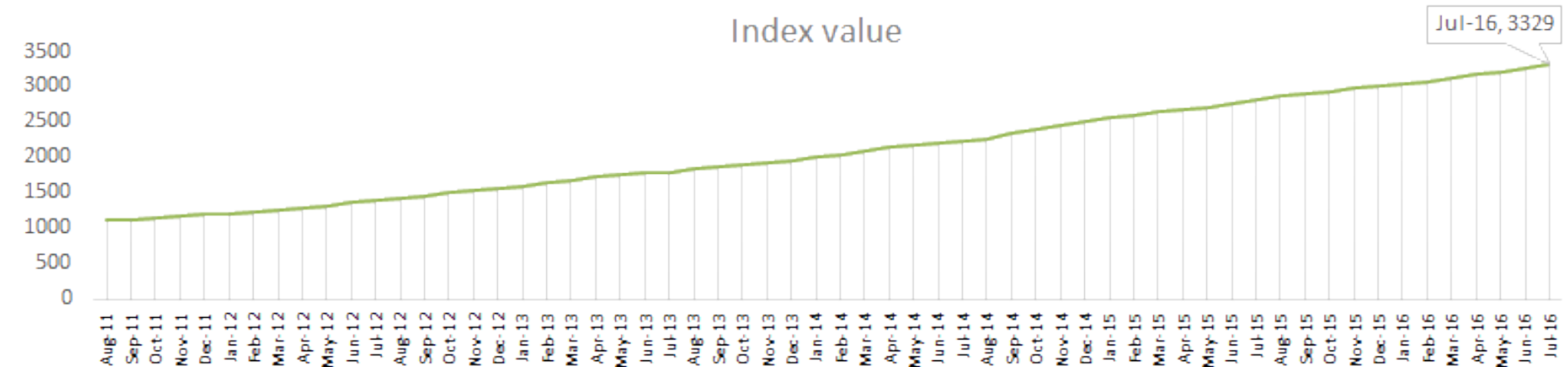
For cyber, Surowiecki advocated extensions of the existing futures markets even into areas such as terrorist activity and prediction markets within companies.

Cyber Index Brought to You By Dan Geer

Continuously compounded rate of change (month over month)
Red line describes mean since inception



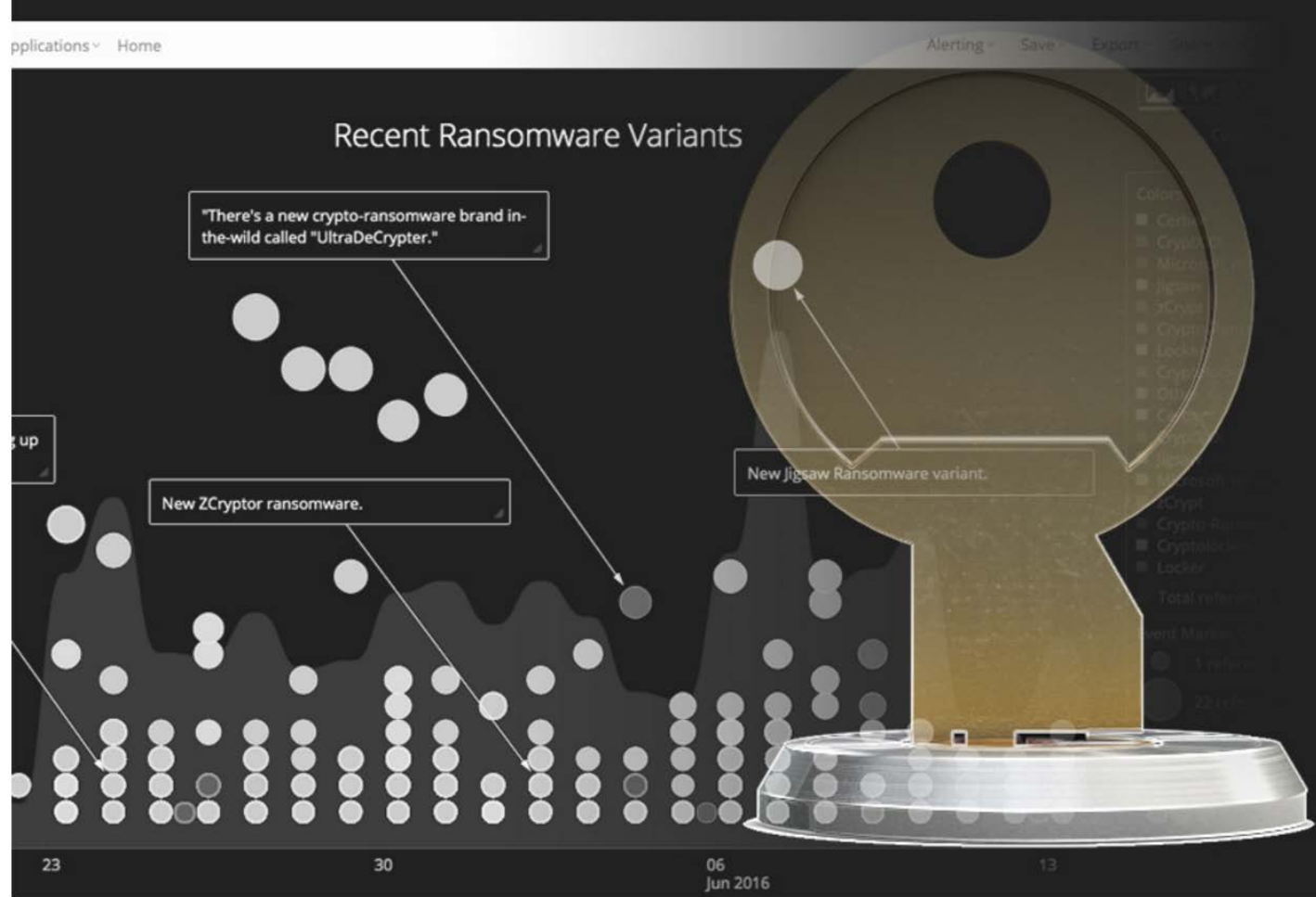
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See the future...



Revealing Ransomware Secrets With All-Source Analysis

Posted in [Cyber Threat Intelligence](#) by Amanda McKeon on August 10, 2016

Ransomware has become a major concern. Stay ahead of ransomware threats by using Recorded Future as part of a holistic threat intelligence capability.

Crowdsourcing is a way of
solving problems and
producing things by connecting
online with **people**
that you otherwise
wouldn't know



Market is Evolving

418 Intelligence is developing a gamified and monetized advanced prediction market platform for enterprises that are struggling to stay on top of the hyper-expanding job of cybersecurity to incentivize and score security analysts from inside and out in providing them accurate on-demand assessments of threat risks and trend impacts that are actionable in real time.

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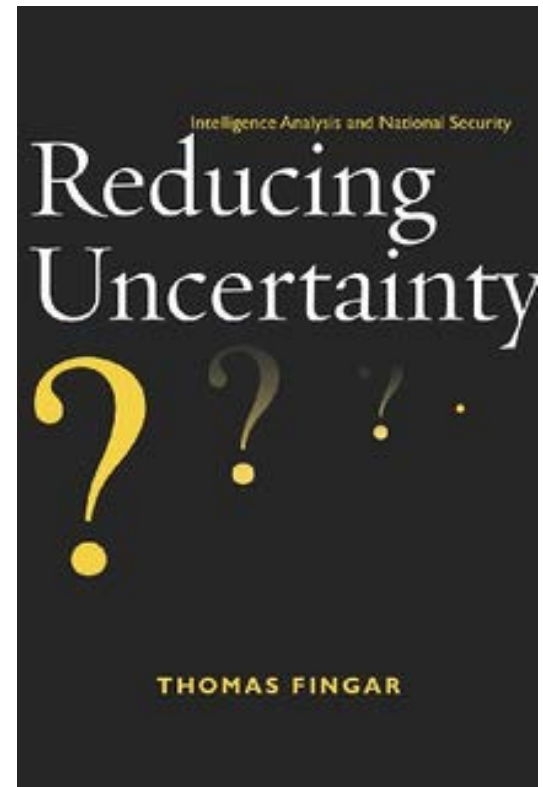
Nasdaq

REVLON
LOVE IS ON

Sources

Most of the resources listed below provide lists and/or APIs to obtain (hopefully) up-to-date information with regards to threats. Some consider these sources as threat intelligence, opinions differ however. A certain amount of (domain- or business-specific) analysis is necessary to create true threat intelligence.

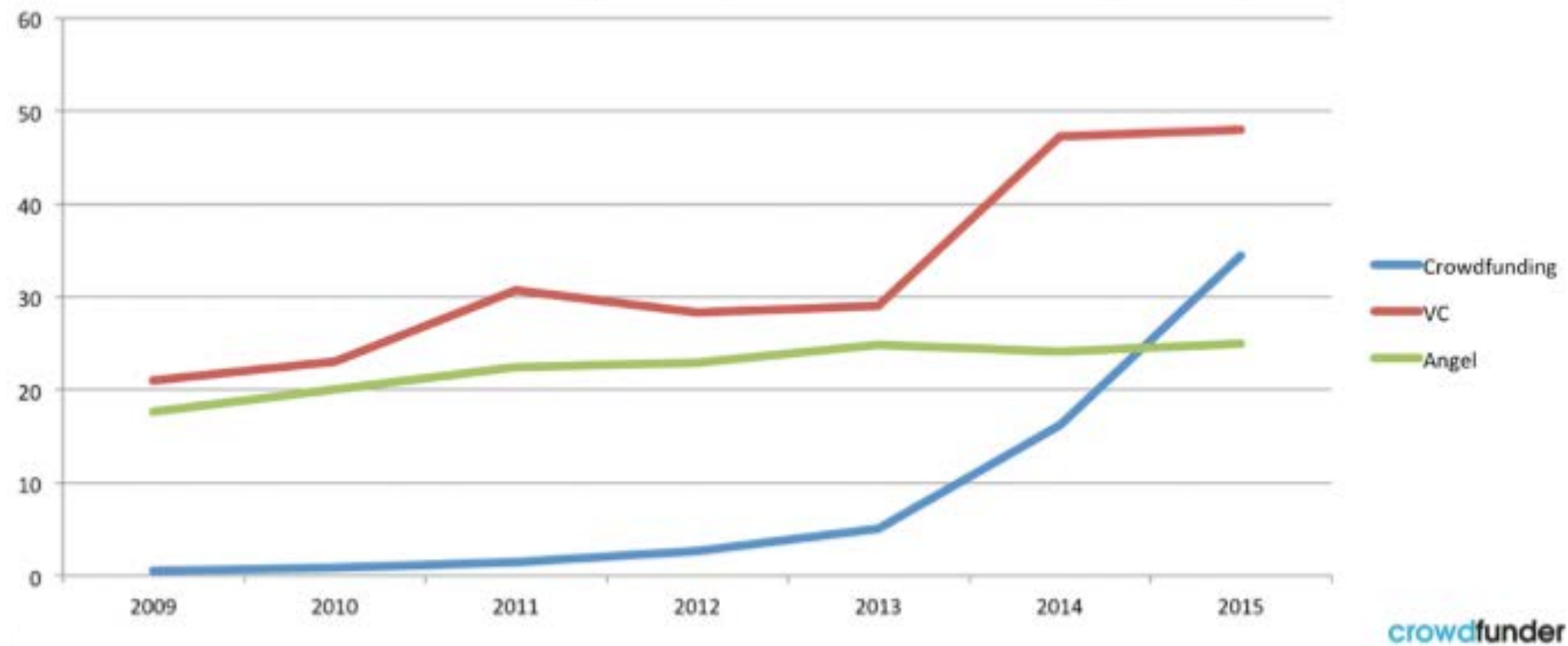
AutoShun	A public service offering at most 2000 malicious IPs and some more resources.
Critical Stack Intel	The free threat intelligence parsed and aggregated by Critical Stack is ready for use in any Bro production system. You can specify which feeds you trust and want to ingest.
C1fApp	C1fApp is a threat feed aggregation application, providing a single feed, both Open Source and private. Provides statistics dashboard, open API for search and is been running for a few years now. Searches are on historical data.
Cymon	Cymon is an aggregator of indicators from multiple sources with history, so you have a single interface to multiple threat feeds. It also provides an API to search a database along with a pretty web interface.
Deepviz Threat Intel	Deepviz offers a sandbox for analyzing malware and has an API available with threat intelligence harvested from the sandbox.
Emerging Threats Firewall Rules	A collection of rules for several types of firewalls, including iptables, PF and PIX.
Emerging Threats IDS Rules	A collection of Snort and Suricata <i>rules</i> files that can be used for alerting or blocking.
FireHOL IP Lists	A firewall blacklist composed from IP lists, providing maximum protection with minimum false positives. Suitable for basic protection on all internet facing servers, routers and firewalls.
Hail a TAXII	Hail a TAXII.com is a repository of Open Source Cyber Threat Intelligence feeds in STIX format. They offer several feeds, including some that are listed here already in a different format, like the Emerging Threats rules and PhishTank feeds.
I-Blocklist	I-Blocklist maintains several types of lists containing IP addresses belonging to various categories. Some of these main categories include countries, ISPs and organizations. Other lists include web attacks, TOR, spyware and proxies. Many are free to use, and available in various formats.
MalwareDomains.com	The DNS-BH project creates and maintains a listing of domains that are known to be used to propagate malware and spyware. These can be used for detection as well as prevention (sinkholing DNS requests).
OpenPhish Feeds	OpenPhish receives URLs from multiple streams and analyzes them using its proprietary phishing detection algorithms. There are free and commercial offerings available.
PhishTank	PhishTank delivers a list of suspected phishing URLs. Their data comes from human reports, but they also ingest external feeds where possible. It's a free service, but registering for an API key is recommended.



Will Equity Crowdfunding Overtake Angel and VC?

The World Bank estimated that crowdfunding would reach \$90 billion by 2020. If the trend of doubling year over year continues, we'll see \$90 billion by 2017.

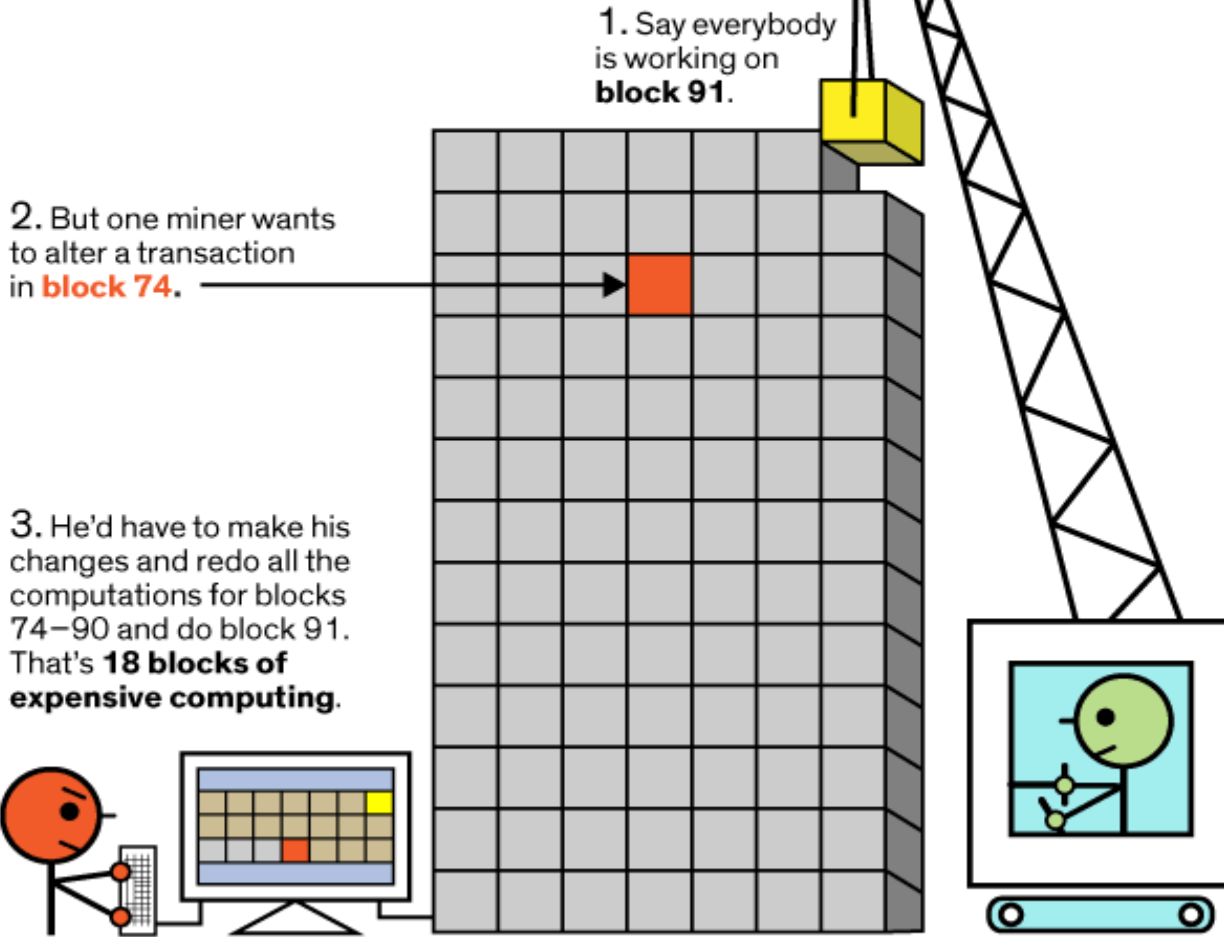
Annual Funding (Billions): VC vs. Crowdfunding vs. Angel



crowdfunder

Why You Can't Cheat at Bitcoin

The Ultimate Application?

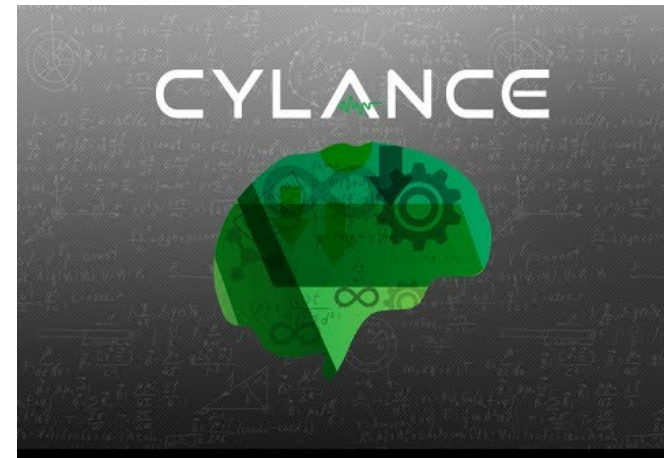


4. What's worse, he'd have to do it all **before** everybody else in the Bitcoin network finished **just the one block (number 91)** that they're working on.

Incorporate Intelligence Into Overall Strategy

- It is one piece of the solution that directly enhances other elements
- Thus, the other parts are critical
- Maximize EVERY \$\$\$

- **Reduce Attack Surface** starting with web browser
- **Outsource/Open Source/Open Stack – Back Office, CRM, Productivity, Storage (Archives at a minimum), etc.**
- **Automate Wherever Possible/Practical & Augment Everything Else**



What's Your Idea??

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