

WELCOME TO THE 14TH ANNUAL CHIEF FISCAL OFFICER CONFERENCE



COMPTROLLER OF THE COMMONWEALTH

THURSDAY NOVEMBER 20, 2014

**FEDERAL RESERVE BANK
BOSTON**



Morning Agenda



- **Welcome and Agenda**
 - Scott Olsen, Director Department Assistance Bureau
- **Opening Remarks**
 - Glen Shor, Secretary for Administration and Finance
- **MassIT Initiatives**
 - Bill Oates, Commonwealth Chief Information Officer
- ***Break***
- **Comptroller Update**
 - Martin J. Benison, Comptroller of the Commonwealth
- **The History of Money**
 - Scott Schuh, Director and Economist, Consumer Payments Research Center, Federal Reserve Bank of Boston

Afternoon Agenda



- **Lunch 12:15-1:15 New England Room 4th Floor**
- **Breakout Sessions – 3rd Floor AV Rooms**
 - **1:15-2:00**
 - ✦ **COMMBUYS Update and Phase 2 Preview** Room AV-1
 - ✦ **Commonwealth Annual Financial Reports** Room AV-3
 - ✦ **Integrated Facilities Management** Room AV-4
 - **2:15-3:00**
 - ✦ **MassIT: Cloud Security/Identity & Access Mgmt** Room AV-1
 - ✦ **COMMBUYS Update and Phase 2 Preview** Room AV-3
 - ✦ **MassHR: Hire Now! And the HR/CMS Upgrade** Room AV-4
 - **3:15-4:00**
 - ✦ **The CFO Playbook – Tools for Success** Room AV-1
 - ✦ **MassIT: Cloud Security/Identity & Access Mgmt** Room AV-3

Access Presentations Online



QR Code

- Scan the code with a QR Reader app on your smartphone or tablet to access presentations from today's sessions.

Goals of the Conference



- Communicate initiatives to the key stakeholders in Commonwealth financial management
- Receive feedback
- Share **CFO best practices** and network
 - Join us at 3:15 for the breakout session “The CFO Playbook – Tools for Success” Room AV-1, 3rd Floor

Glen Shor



**SECRETARY FOR ADMINISTRATION AND
FINANCE**



Bill Oates



**COMMONWEALTH CHIEF INFORMATION
OFFICER**



Evolving IT at the Commonwealth

Aligning Business & Technology to Drive Positive Change



November 2014

Massachusetts Office of Information Technology
Executive Office for Administration and Finance

Bill Oates
Commonwealth Chief Information Officer

The Massachusetts Office of Information Technology, known as MassIT, is the state's lead agency for technology & innovation. We serve more than 150 state agencies and cities, towns, & schools across the state.

Agenda

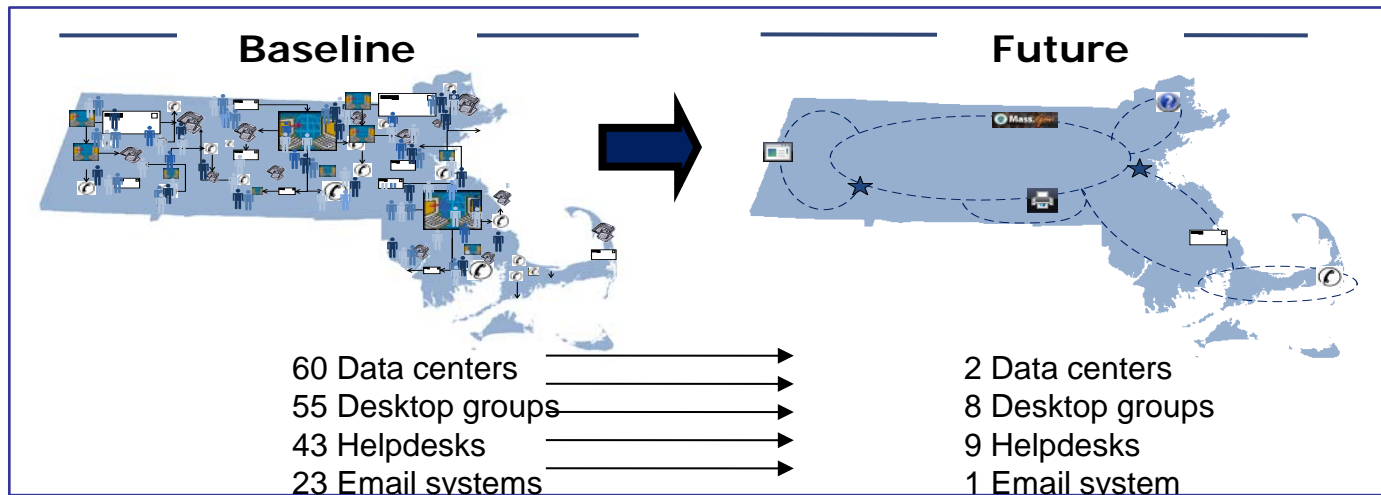
- Building on Our Strong Foundation
- Moving the Commonwealth Forward
- A Few Recent Accomplishments
- Our Focus
 - More Strategic Investments, Stronger Oversight
 - Paving the Way for Innovation & Collaboration
 - Developing a Culture of Innovation
 - The Municipal Opportunity
 - Becoming Data Savvy
 - Modernizing Our Approach to Recruiting
- Next Steps...

Building on Our Strong Foundation

- A new approach to aligning business and technology
 - In response to challenges and unprecedented scrutiny, the Administration and Legislature took steps.....
- A new way of working together and providing services
 - MassIT is now an activist IT organization



Our job: build on the success of consolidation & recent reform



Moving the Commonwealth Forward



A Few Recent Accomplishments

Chief Operating Officer charged with 24x7 operational excellence

Project management oversight of 2014 phase of HIX

Prioritized small projects with fast deliverables, leveraging emerging tech and Agile methodology

Increased oversight of major initiatives: RMV modernization, MassTax2, UI Online

Expanded legal support for procurement and contract management

Focused on ROI and likelihood of success for allocation of capital IT funds

Embraced innovation with GIO role folded into MassIT

Launched first Innovation Fellows Program

Created Office of Municipal & School Technology.

We now offer affordable broadband connectivity to municipalities and e-Rate services to schools.

Created leadership role to champion partnerships that bridge the inside/outside government gap

More Strategic Investments, Stronger Oversight

- Rigorous business case discipline for IT initiatives
 - Evaluate proposals against investment grade benchmarks; likelihood of success; and expected ROI and constituent impact
 - We're better at articulating benefits, estimating costs, & picking right projects
 - Results: better oversight, shorter projects, faster return
- Strategic project assistance
 - Proactive involvement in major projects, including RMV, UI Online, MassTax2
 - Major project intercession; now proceeding with a more Agile approach
- Improved project oversight capability
 - IT Portfolio Oversight Committee
 - New Enterprise Project Management Office – focused first on HIX

Paving the Way for Innovation & Collaboration

Embracing opportunities for tech-enabled change...



- Creating path to cloud, mobility, social media, & data
- Bridging the inside / outside government gap

Developing a Culture of Innovation

Simple goal: Deliver value – faster

- At workforce and project levels
 - Implement high value pilots – focus on the citizen experience
 - Build critical mass around innovation
- First class of Innovation Fellows at work
 - Each has an impressive background in focus area
 - They quickly have an impact in their area of expertise
 - We get targeted help to meet pressing business needs



Driving Innovation – Six in Six

Six in Six (Plus One) Projects

- | | |
|----|--|
| 1. | Centralized system & mobile app for Public Housing |
| 2. | Pilot of centralized database for homeless clients |
| 3. | Pilot leveraging data visualization with GIS |
| 4. | Creation of <i>Rapid Apps</i> team/approach |
| 5. | Innovative Procurement Competition |
| 6. | Lower-cost broadband for K-12 in western MA |
| 7. | Free public wifi – starting in Gateway Cities |

MassIT Government Innovation Competition – 21 Applicants!

	Team Name	Description
	Amida Technology Solutions	Consolidates medical records
	Astra IDentity, Inc.	Email security
	Cabinet	Constituent management
	CampusTap	Recruiting (HR)
	CareerVillage.org	Recruiting (HR)
	CarKnow LLC	Transportation and logistics
	Dimples, Inc.	Ink conservation
	EdTrips	School field trips
	Hablando con Julis	Accessibility
	Jenyta Market	Digital workflow

	Team Name	Description
	Kinems Learning Games	ADHD education
	Lig	Constitute legal empowerment
	MyndLift	Accessibility and education
	OpportunitySpace	Gov't space efficiency
	PetSimpl	Pet tracker
	Reserve-a-Game	Parks and recreation
	ScriptEd, Inc.	Code education for poor
	SitterCycle.com	Childcare training
	Tavana LLC	Bike safety
	Twiage	EMS
	VoiceItt	Accessibility



Government is becoming
a digital business.
Let's build it together.

Our Winners

AstraIDentity, Governor Patrick, CarKnow, & GIO Tony Parham
at the MassChallenge Awards Ceremony



AstraIDentity



The Municipal Opportunity

More than outreach – solutions.

- **What we are working on:**

- *IT to improve local services & effectiveness*
- *Better connectivity, infrastructure, applications*
- *Enhancing technology for schools*

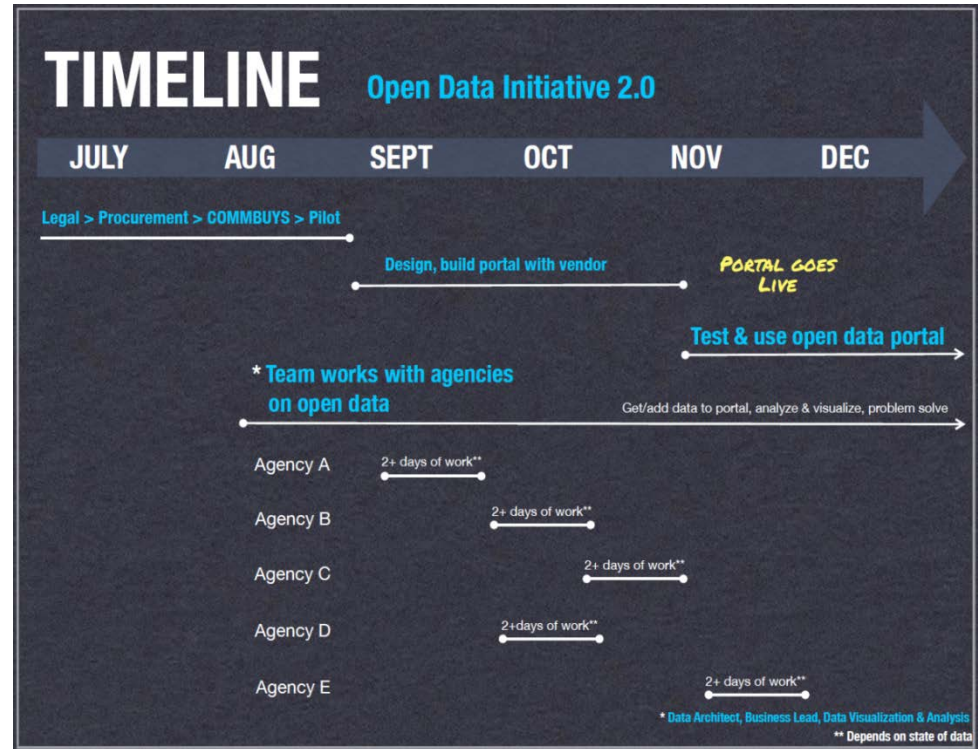


- **How we will get it done:**

- *Deputy Commonwealth CIO*
- *Office of Municipal & School Tech*
- *IT bond bill, with state education agencies*
- *Community Innovation Challenge Grants and partnerships*

Becoming Data Savvy

- Leverage the data deluge.
 - Transform data...
into meaningful information
- Drive culture shift from
“need to know” to
“responsibility to share”
- Looking ahead, plan for data from other systems...
 - Social media: sentiment analysis and trends
 - Sensors: the Internet of Things



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Our Next Steps...

Together, foster a culture of innovation & collaboration.

Continue to drive excellence in project management.

Collaborate productively across boundaries.

Deliver value to the Commonwealth.



Thank You

- Bill.Oates@Mass.gov
- www.Mass.gov/MassIT



Martin J. Benison



COMPTROLLER OF THE COMMONWEALTH

Partners in Sound Financial Management



- **People**
- **Accountability**
- **Responsibility**
- **Trust**
- **Negotiation**
- **Efficiency**
- **Risk Management and Mitigation**
- **Solutions**

Department Advisory Group



- The Department Advisory Group is comprised of a cross section of state government, representative of large and small agencies both inside and outside of the Executive branch.
- The role of the advisory group members is to:
 - Identify departmental concerns and/or issues
 - Review impacts of updates and changes to financial applications
 - Review and comment on:
 - ✦ New policies and significant policy updates
 - ✦ New training offerings
 - ✦ CFO Conference content

Senior Staff Changes



Tom Shack

Deputy Comptroller/ Chief Operating Officer



Chris Guido

Deputy Comptroller/ Chief Information Officer

New Unit Managers



Dave Margas

Contracts and Tax Management Unit Manager



Thomas Smith-Vaughan

Payee and Payment Unit Manager

FY14 Financial Results



- FY14 operating deficit of \$424 million in the budgeted funds
- \$750 million one-time sources
- Budgeted fund ending balance of almost \$1.451 billion
- Tax revenue up \$1.2 billion, or 5.8%,
 - Continuing Economic Growth
 - Departmental revenues increased
- Total budgeted fund revenues and other financing sources \$35.5 billion - up \$1.694 billion, or 5.0%

FY14 Financial Results



- **\$308 million decline in Stabilization Fund balance,**
 - withdrawal of \$350 million
 - revenues of \$414 million from judgments and settlements exceeding \$10 million were diverted to the General fund
 - Capital Gains Tax revenue of \$45 million was deposited in this fund
 - The net withdrawal despite substantial revenue growth indicates continued budget stress
- **Ending Stabilization Fund balance of \$1.25 billion**
 - 3.7% of the Total General Fund expenditures
 - National Median 4.2% of the Total General Fund expenditures

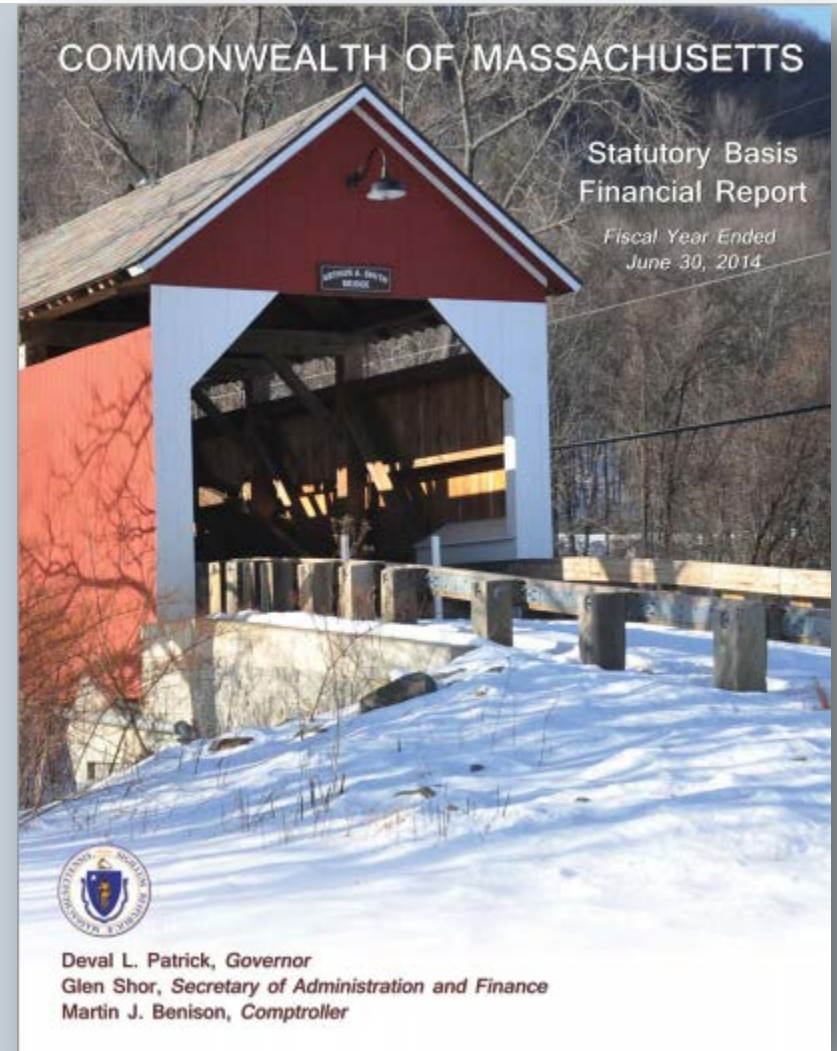
FY14 Financial Results



- Only \$4.6 million of capital gains tax revenues were deposited in the state pension fund and a trust to fund state retiree health care benefits compared to \$47 million in FY13
- \$102.5 million of the General Fund balance was used to offset deficit in the Commonwealth Transportation Fund
- \$175.6 million were reserved for continuing appropriations

Statutory Basis Financial Report (SBFR)

- For Fiscal Year ended June 30, 2014
- Available under “Publications and Reports”
- Join us at 1:15 for the breakout session “Understanding Commonwealth Annual Financial Reports”
Room AV-3, 3rd Floor



FY2014 Review



- **Fraud Awareness and Prevention**
- **MMARS 3.9 Upgrade**
- **Revenue Collection Enhancements**
- **MassHR Update**

-
- A word cloud visualization of terms related to identity theft and fraud. The words are arranged in a horizontal, somewhat circular pattern. The largest words are 'identity', 'theft', 'credit', 'information', 'fraud', 'accounts', 'using', 'stolen', 'crime', 'reason', 'purpose', 'compromised', 'stays', 'years', 'learn', 'become', 'often', 'problem', 'fell', 'thousands', 'times', 'take', 'find', 'idea', 'Card', 'personal', 'creating', 'defeated', 'within', 'probably', 'shock', 'cases', 'acquire', 'bills', 'created', 'does', 'way', 'may', 'someone', 'name', 'complete', 'false', 'show', 'illegal', 'graduates', 'matter', 'happening', 'Simple', 'statement', 'Security', 'actually', 'received', 'couldn', 'earned', 'people', 'emotion', 'decade', 'steals', 'anger', 'ashamed', 'belong', 'Number', 'wages', 'notice', 'dollars', 'think', 'first', 'Everyone', 'Found', 'Imagine', 'even', 'feel', 'experience', 'knowledge', 'changed', 'might', 'takes', 'known', 'fraudulent', 'turned', 'True'. The colors range from dark blue to light green, with some words in orange or yellow.

Shortcuts Can Lead to Fraud



- **Ensure Policy and Job Aid Review**
- **Ensure Segregation of Duties**
- **Document your compliance**
- **As processes change review controls**
- **Consider Internal Audit for High Risk activities**
- **Join the Internal Audit Community of Practice**

Vigilance Needed By All Parties



- **HR/CMS**
 - Re-enter password when changing bank account data
 - E-mail is issued when there is a change to sensitive data
 - Change not allowed by employee if e-mail is not on file
- **Departments**
 - Virus software
 - If check is suddenly generated, payroll department may inquire
- **Employees**
 - Do not click on link or provide User ID and/or Password
 - Check e-mail at least weekly
 - If accessing from home, virus software is in place

Password / Security Management



- NEVER share your ID and password
- Difficult to not use the same password
 - ***At a minimum***, use different passwords for work and personal use
- Always lock your PC when you leave your desk
- Don't forget about paper – don't leave PII sitting around!

Set the Tone at the Top



- **Group Training conducted for Departments**
 - Fraud Awareness and Prevention
 - Risk Management / Internal Controls
- **We will work with you to deliver customized training**
Comptroller.Info@State.MA.US

MMARS 3.9 Upgrade



- MMARS 3.9.0.1 went live on May 27, 2014
- Infrastructure updated
- GUI (graphical user interface) changed
- Accessibility improvements
- Foundation for new technology critical to several coming applications

3.9 Upgrade



- 1st month CTR provided 89% of the scheduled hours
- System stabilized
- October, CTR Provided 100% of scheduled hours
- Assuring MMARS uptime is our highest priority

Intercept Web App



- **Release 2.0 Live November 10, 2014!**
- **Originally built in 2001**
 - Utilized by 36 departments
 - Total Intercept collection of over \$113 million

Intercept Web App Enhancements



- File format expanded to include both .txt and .xml
- Expanded web browser support and increased application performance
- Web-hosted application no longer requires a VPN certificate to connect
- Utilization of Hypertext Transfer Protocol Secure (HTTPS), thus protecting page authenticity and securing accounts
- Self-service “Forgot Password” functionality
- Comprehensive real-time file error checking notification to ensure successful file validation
- Download file formats (.txt, .xls) expanded to include .xml and .csv
- Does not require a MMARS Batch Interface Event (BIEVNT) entry. Debt file upload authorization is performed directly in the web application

CIW Previous Day Data



- Congratulations to the MassIT team!
- Previous day MMARS and LCM data available in the CIW
 - Went live 10/27/2014
- <http://www.iw.state.ma.us>

FY2015 Initiatives



- **W-2 Suppression**
- **Transition**
- **Affordable Care Act (ACA)**
- **Sub Recipients**
- **HR/CMS Upgrade**
- **COMMBUYS Phase 2**
- **Additional MMARS Enhancements**
- **Identity and Access Management**
- **Prompt Pay Discounts**

W-2 Suppression



- Suppress your W-2 in Self Service
 - Safe and Secure
 - Go Green!
 - Receive it online earlier than by mail
- Promotional materials available for distribution

W-2 Online Delivery

BENEFITS

Choose to have your **W-2** delivered online

Suppressed is the best

Stop Paper Excess

Get Your W-2 online & Go Green at Tax Time!

No Chance of your W-2 being lost, stolen, delayed or misplaced

Access your W-2 faster than by mail

Secure access through employee self service

Job aids are available online: <http://www.mass.gov/MassHR>

W-2 Online Delivery

Choose to have Your W-2 Form Delivered Online

Benefits of Online Delivery

Access to your W-2 sooner than by mail

No possibility of your W-2 being lost, stolen, delayed or misplaced

Secure access through Employee Self Service

Job Aids are available online at: www.mass.gov/MassHR

Transition

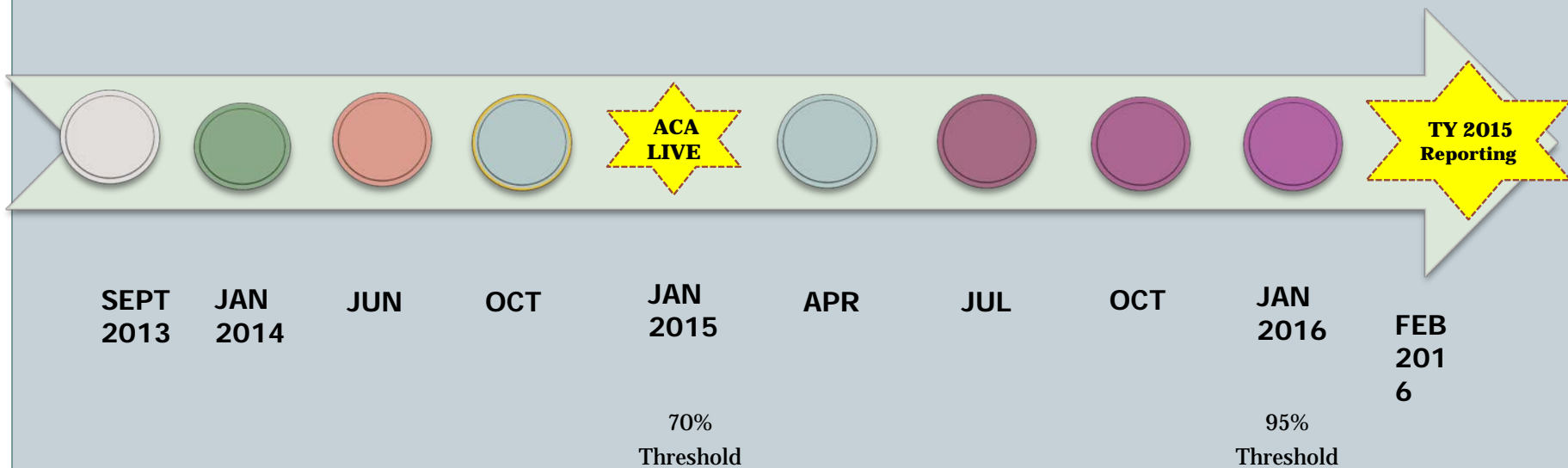


- **New manager training available**
 - Intro to State Finance
 - Executive Overview of State Government
 - Risk Management / Fraud Prevention
- **See [Course Catalog](#) or contact us for group sessions**
 - Comptroller.info@state.ma.us
- **Ensure the following are reviewed and up to date**
 - New Department Head Memo
 - Internal Control Plans
 - Policies
 - Procedures
 - Performance Metrics
- **Join us at 3:15 for the breakout session “The CFO Playbook – Tools for Success” Room AV-1, 3rd Floor**

Overview of the ACA Implementation

Milestone 1

Timeline



Milestones

Meeting Monthly Setting Goals Defining Terms

Meeting Quarterly Review of Look Back

Final Review of all earnings codes for proper use

Live: Data Review & monthly summary

HR/CMS Upgrade to PS 9.2

Department Exception reporting

Report Testing

Tax Form Deadline Jan 2016

Ongoing : Payroll and HR Department/Agency Staff and Employee Communications

Overview of the ACA Implementation



- **Workgroup Members**
 - Administration and Finance
 - Office of the Comptroller
 - Group Insurance Commission
 - Information Technology Division
 - Human Resources Division
 - Department Higher Education
 - University of Massachusetts

Affordable Care Act (ACA) Employer Share Responsibility (ESR) Compliance Reporting



- Effective January 1, 2015
- ACA Full-time Eligibility: 30 hours a week or 130 hours a month combined across all active Employee Record numbers
- Non-compliance may result in ESR penalty to the Commonwealth
- Requires reporting:
 - ✦ Hours Worked
 - ✦ Certain Leave Hours
- All wages (worked time and compensated absences) must be reported with hourly rate and hours worked.
- No lump sum wage payments allowed

ACA-ESR Compliance Reporting



- **HR/CMS Data Clean-up / Next Steps**
 - Wage related payments must be reported using correct hours through Timesheet
 - Job Hourly Rate – need to reflect minimum wage per hour compliance
 - Standard Hours corrections – specifically for Adjunct Faculty
 - CTR issued FY Memo – Remove improper Earnings Codes and departments will be instructed to use appropriate codes.
 - Review updated Job aids impacted by HR/CMS Changes

- **New HR/CMS Page to Track ACA Full Time Status and Health Insurance Offers**
 - High level Requirements include:
 - ✦ Employee level reporting for all job records
 - ✦ Automate Data where possible
 - ✦ Manual entries with rigorous 'point of entry' system validations
 - ✦ Tracking of Employee's Elect / Waive Insurance Status
 - ✦ Iterative validations would occur
 - Change Management for new pages and related reports in time for 1st reporting deadline in 2015. Migration Mid- February for 1st month's look back reporting.

New Federal Grant Accounting and Reporting Policy



- **New policy issued 9/8/2014 – combines multiple Federal Grant policies**
- **Covers:**
 - Applying for a Grant
 - Use of DUNS numbers
 - Indirect Costs
 - Disbursements
 - Posting and Contract Requirements for Federal Subgrants
 - Reconciliation
 - Reporting, including FFATA

Subrecipients



- **Payment reported in the Schedule of Expenditure of Financial Awards (SEFA)**
- **Based on use of sub-recipient object codes**
- **Auditor reporting a unacceptable error rate**
- **Will be correct manually in the FY14 SEFA**
- **Data must be corrected in MMARS in FY15**

HR/CMS 9.2 Upgrade



- Go-Live Spring 2015
- Streamlined and Improved Navigation
- Enhanced On-Line Information for Managers and Employees
- New Functionality Opportunities:
 - Workflow
 - Organizational Charts and
 - Employee Related Content
- Learn More at this afternoon's session
 - MassHR Hire Now! and the HR/CMS 9.2 Upgrade
 - 2:15 - 3:00 AV4 3rd Floor

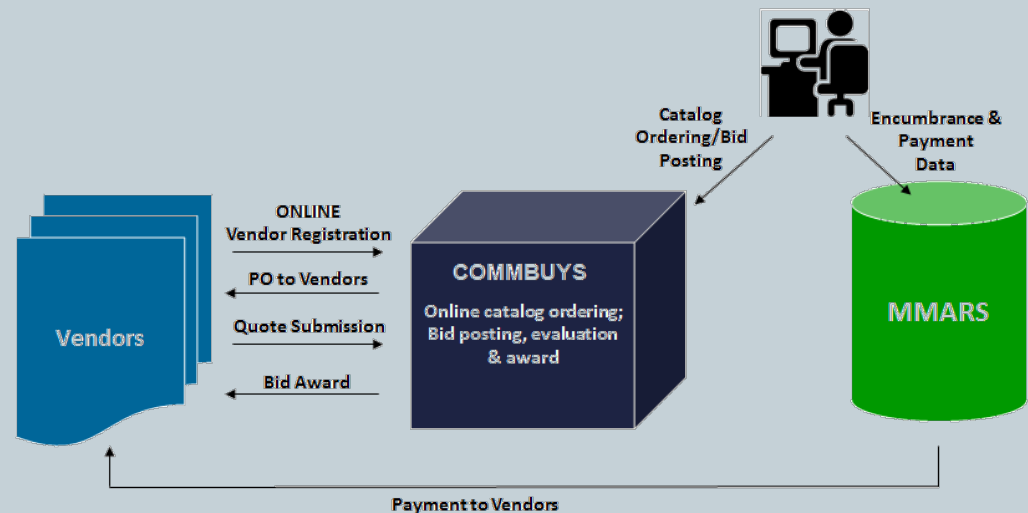
Phase I: Launch COMMBUYS, an online tool to support purchasing and procurement



- **COMMBUYS came online March 24, 2014; focused on Executive Departments**
 - ✓ Online vendor registration
 - ✓ Catalog ordering
 - ✓ Robust bid management, including online posting, evaluation and award
 - ✓ Comprehensive training for users
 - ✓ Helpdesk and other support

Current COMMBUYS Statistics

- \$20M in orders
- 8,000 registered vendors
- 2,000 bids posted
- 380,000 catalog items



COMMBUYS Phase 2



- Working closely with our partners at OSD
- Integration with MMARS
- Web Services
 - Allows for real time interfaces and status return files
 - Working with CGI on proof of concept
- Learn more at COMMBUYS Phase 2 Breakout session
 - 1:15 Room AV1 or
 - 2:15 Room AV3, 3rd Floor

Additional MMARS Enhancements



- **Vendor Self Service**
 - Feasibility study
 - Developing a roadmap
 - Allows for Vendor self registration, contact/address updates
 - View payment history and scheduled payments, ultimately replace VendorWeb
- **Compatibility pack to support use with IE 10**
- **Masking TINs**
- **Hiding Fields**

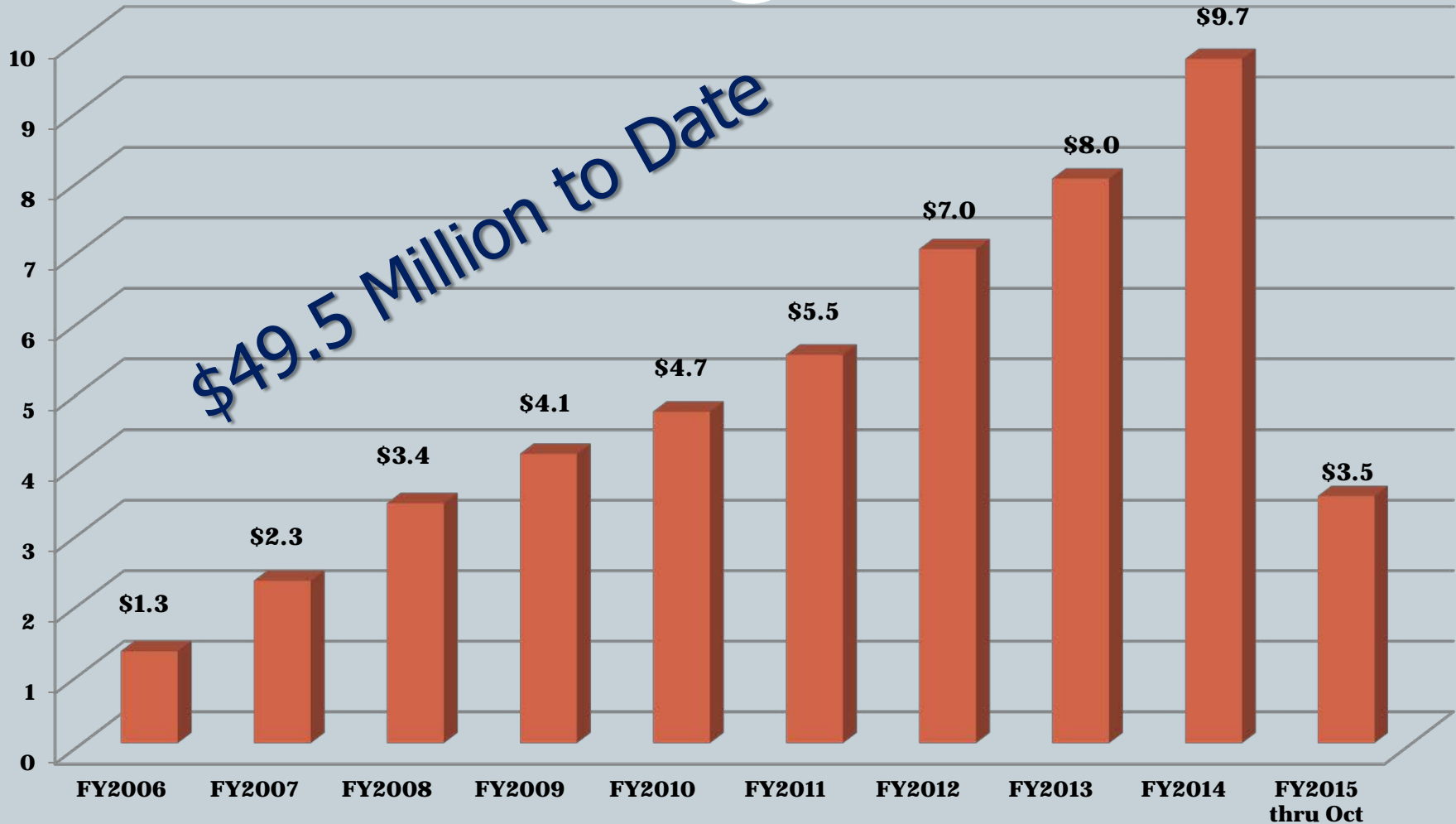
Identity and Access Management



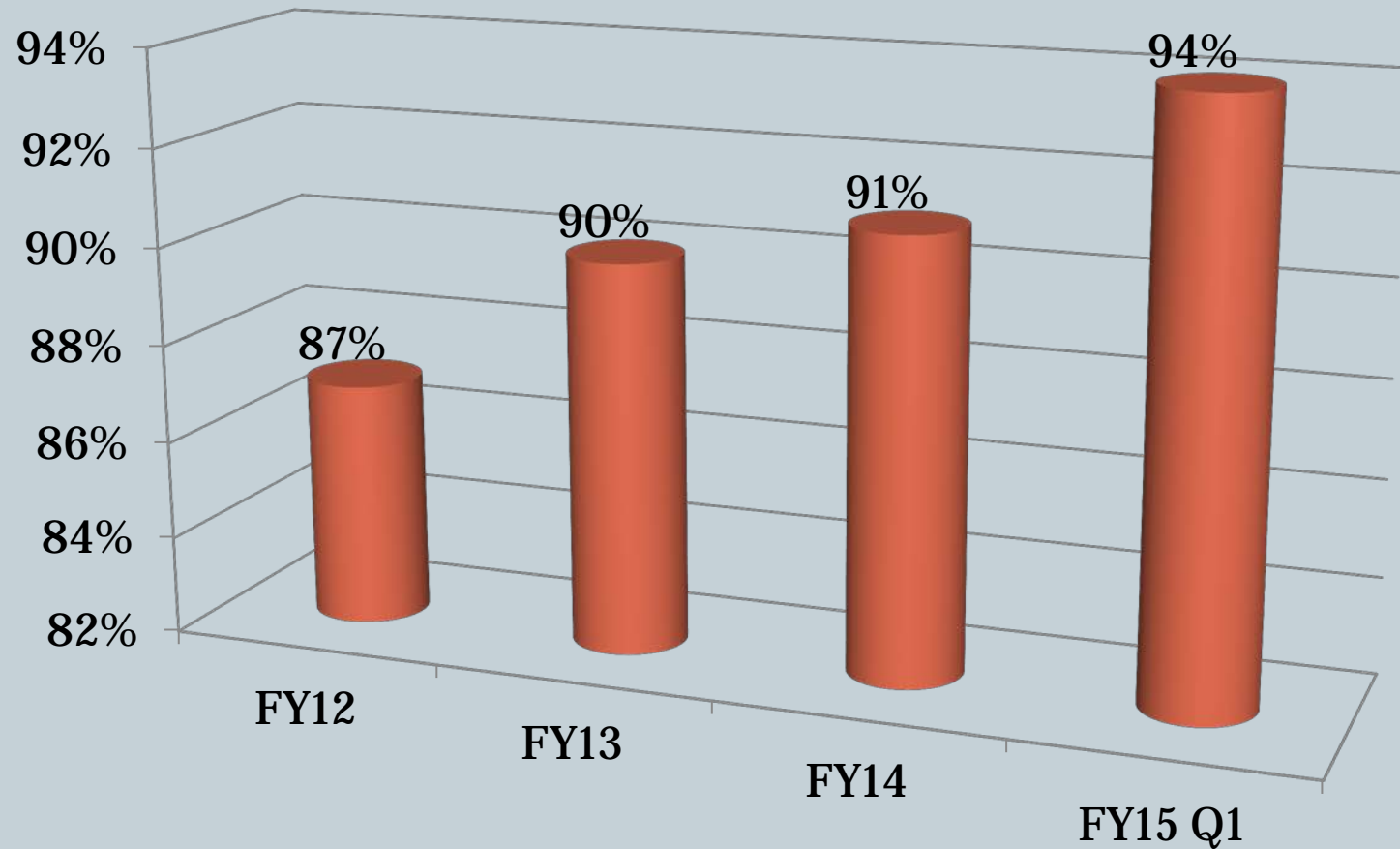
- **Benefit to Commonwealth – Increased Security**
- **Benefit to Employees – Single Sign-on**
- **Currently in use by MassIT**
- **Pilot to include HR/CMS**

- **Learn more at MassIT Breakout session**
 - 2:15 Room AV1 or
 - 3:15 Room AV3, 3rd Floor

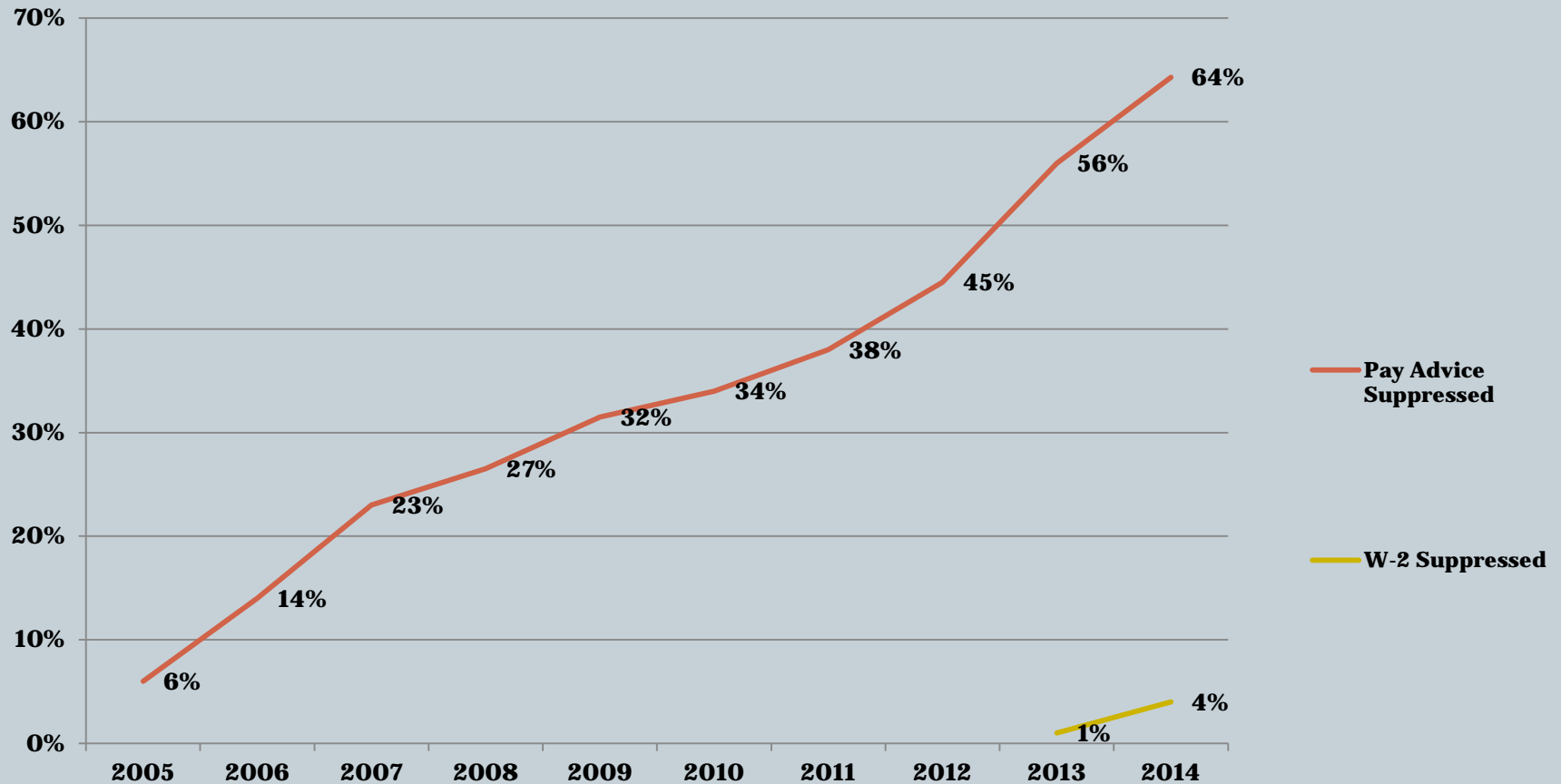
Statewide Discounts Saved (in \$ million)



Improvement Continues – Vendors Paid via EFT Contracts Under Delegation



Payroll – Remittance Advice Suppression



In 10 years we made a lot of progress - Adoption of W-2's should be quicker

Suppression by Department



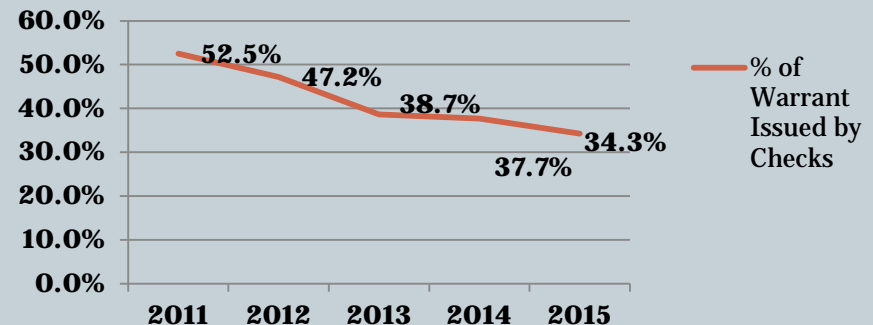
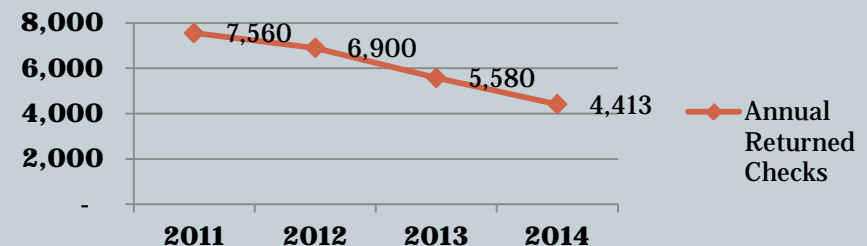
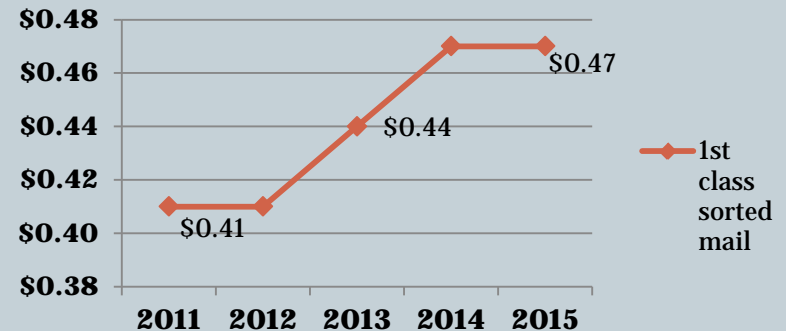
- 43 Departments are 100%
- An Additional 22 Departments are 98% or greater possibly a new hire, or 2, or bank account change
- 34 more departments have 50 or less remittance advices generated
 - Its time to print locally
 - Contact the Payroll Bureau to suppress all

EFT Payments Are Saving >\$100,000 annually

- Cost of mailings continue to rise

To offset the increases:

- Return mail is declining about 20% annually
- Payments via checks are declining about 9% annually



Savings to Our Bottom Line or Are You Using All the Fiscal Tools Available?



- **Prompt Payment Discounts**
- **Vendor Accounts Receivable Audits**
- **Intercept Revenues**
- **Paperless Payments**
 - Payroll
 - Vendors
- **PCard Program**

CTR Partnership with Departments



- CTR Senior Staff is available today at lunch and during breaks
- Bureau Directors will be available in the AV lounge

Scott Schuh



**DIRECTOR AND ECONOMIST,
CONSUMER PAYMENTS RESEARCH CENTER,
FEDERAL RESERVE BANK OF BOSTON**

The Transformation of Money from Physical to Electronic

Scott Schuh
Federal Reserve Bank of Boston

Presented to the
Massachusetts State Government CFO Conference
November 20, 2014

Overview

- History of money (brief)
- Money and payments today
- Electronic money and virtual currencies
- Future of money, payments, and banking

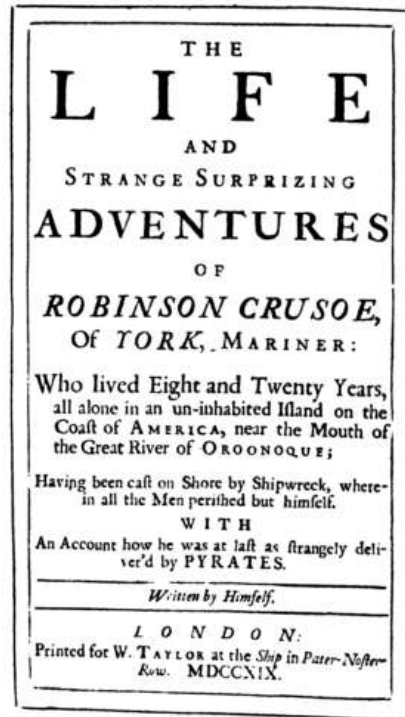


History of Money

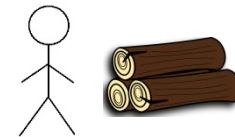
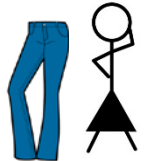


Transition #1

From “Robinson Crusoe” economy to exchange



???

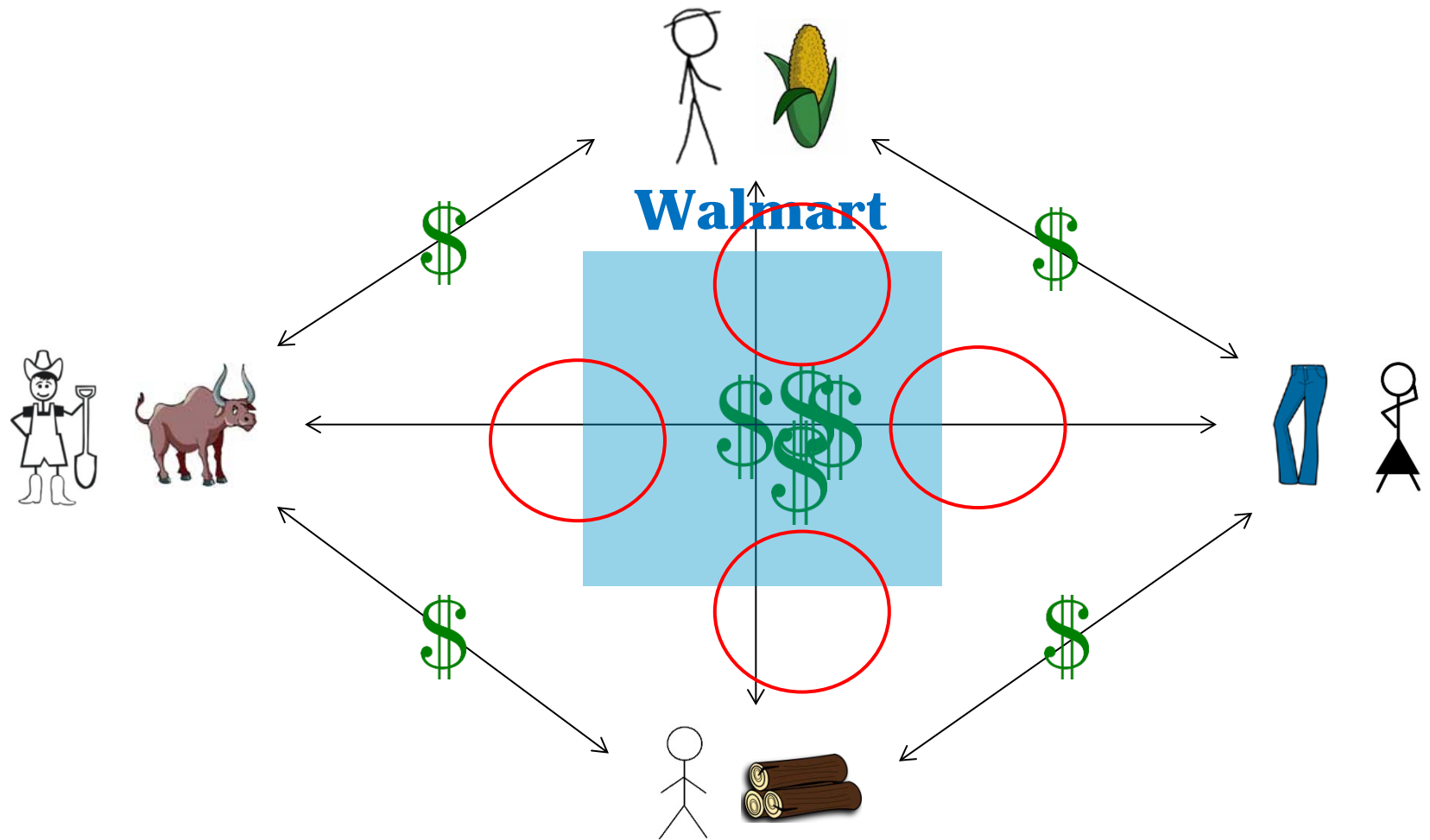


Producer = consumer

Exchange (barter) = “double coincidence of wants”

Transition #2

From barter to monetary economy



Three main functions of money

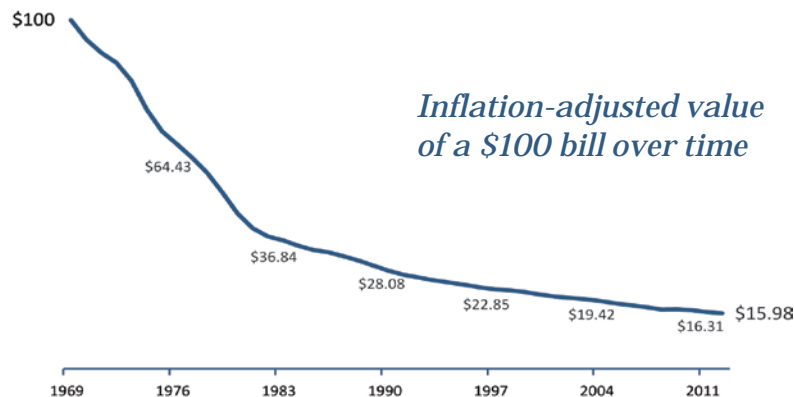
- **Unit of account**

- \$0.01, \$0.05, \$0.10, \$0.25, \$1, \$2, \$5, \$10, \$20, \$50, \$100,...

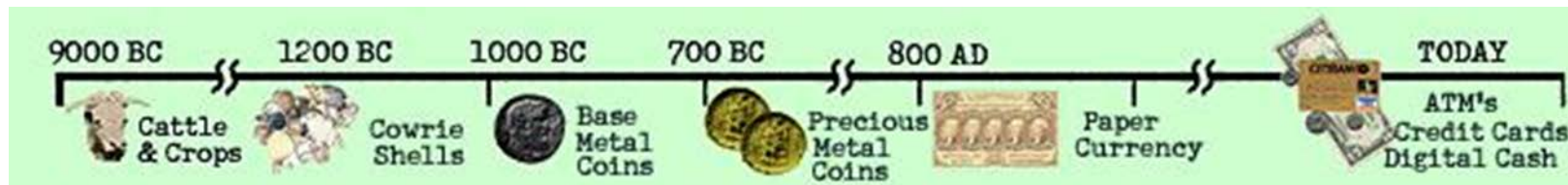
- **Medium of exchange**

- Coins, bills, and deposit accounts (checks, debit cards, etc.....)

- **Store of value**



History of money as medium of exchange



Innovations to reduce transaction costs:

- Smaller in size
- Lighter to carry
- More durable to last longer
- Cheaper and easier to store
- Safer from theft and fraud
- Faster to authorize, clear, and settle
- Lower fees for payer and payee

Private versus public money



Private

- Emerges from market
- Has intrinsic value
 - Metals, commodities, etc.
- Backed by owner(s)
- Not legal tender
- Value susceptible to private motives (profit, market pricing, fraud)

Public

- Created by govt. fiat
- Maybe intrinsic value
 - E.g., gold standard
 - Debt (government IOU)
- Backed by tax authority
- Legal tender (pays tax)
- Value susceptible to govt. motives (inflation tax, exchange rates)

Transition #3

From physical to electronic money

“Yesterday”

Will that be



or

First National Bank
Hollywood, Ca.

Date April 1, 2002

Pay to the
Order Of Parisian Gown Shoppe \$ 750.00

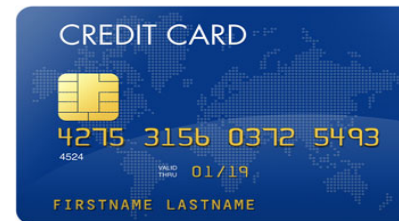
Seven hundred fifty ———— xx Dollars

Lawrence Exeter, Jr.

...

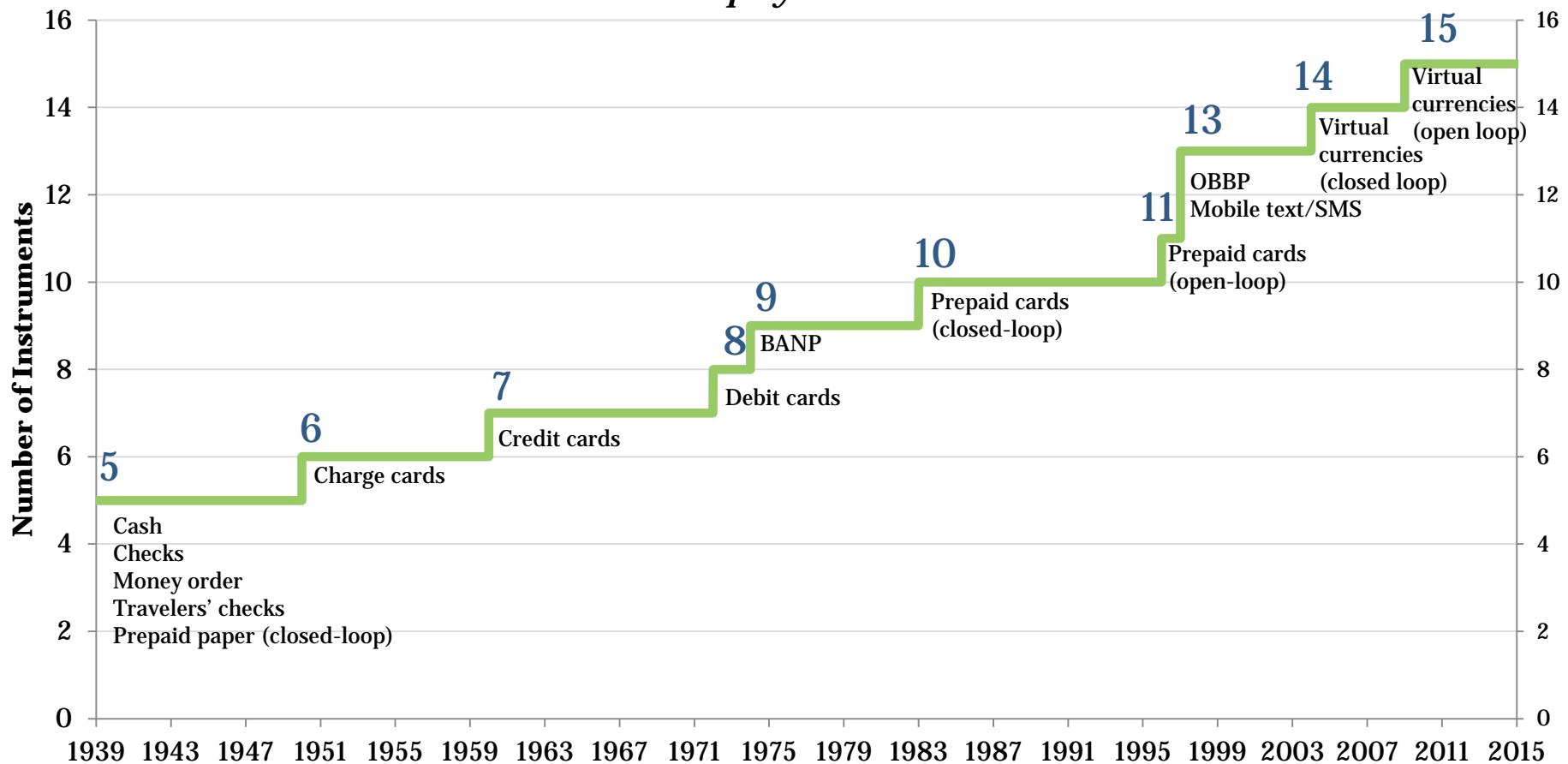
“Today”

... or



Availability of payment instruments

U.S. consumers have more payment instruments to choose from



Source: Author's research.

Money and Payments Today



Relationship between money and payments

Macro/monetary view

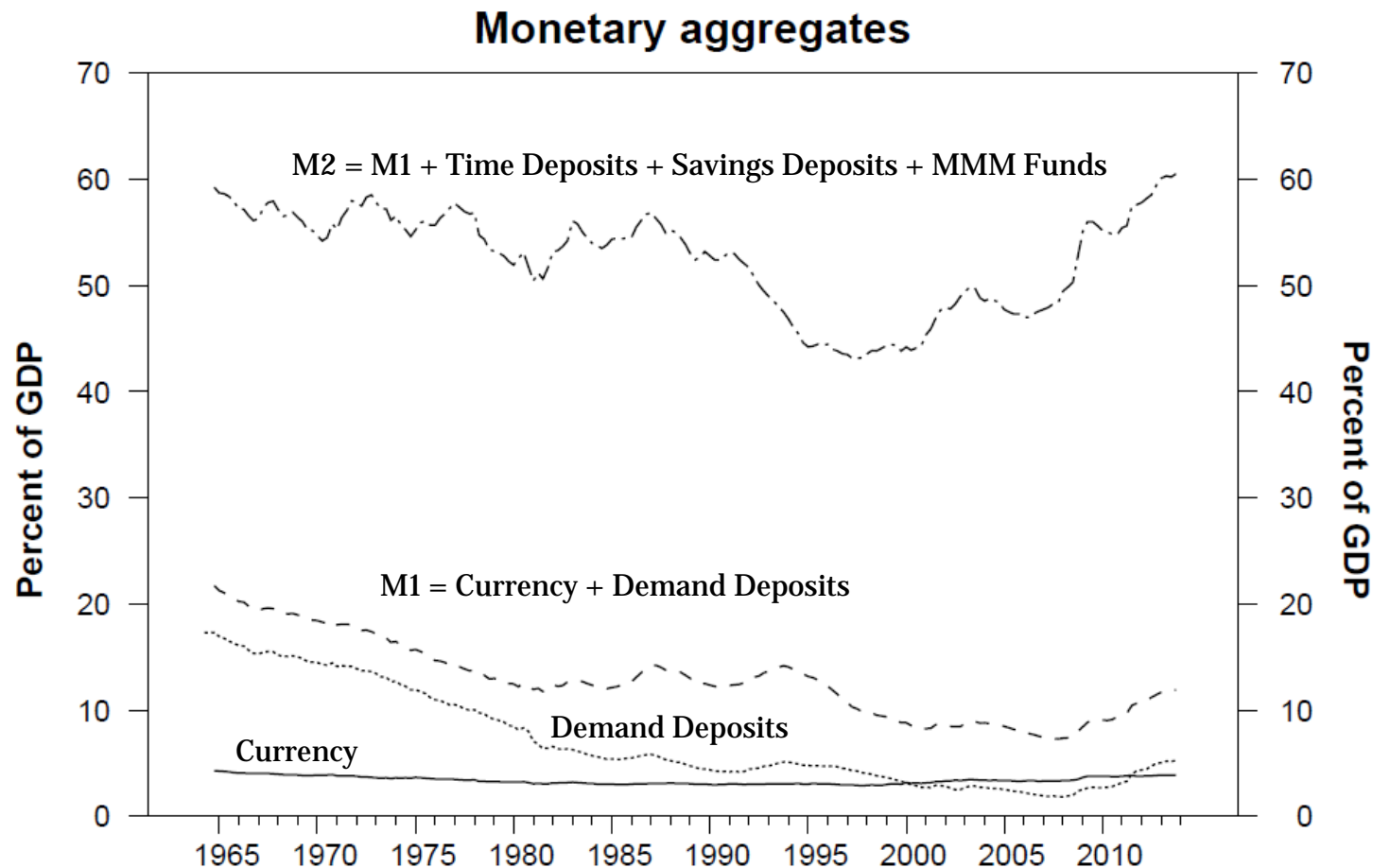
Micro/IO view

Asset or Liability	Basic Money or Debt	Instrument (derivative media)	Physical trait
Money (M1)	Currency in circulation	Currency	Paper / metal
	Travelers check	Travelers check	
	Demand deposit accounts & Other checkable deposits	Checks (Personal, Certified, Cashiers)	
		Money order	
		Online banking bill pay (OBBP)	Electronic
		Bank account number payment (BANP)	
		Direct deduction from income	
		Debit	Card
		Prepaid	
Credit	Revolving	Credit	
	Nonrevolving	Charge	Electronic
		Text/SMS	
Unknown/unspecified	???	<u>Nonbank</u> money order or prepaid card; virtual currencies	Mixed

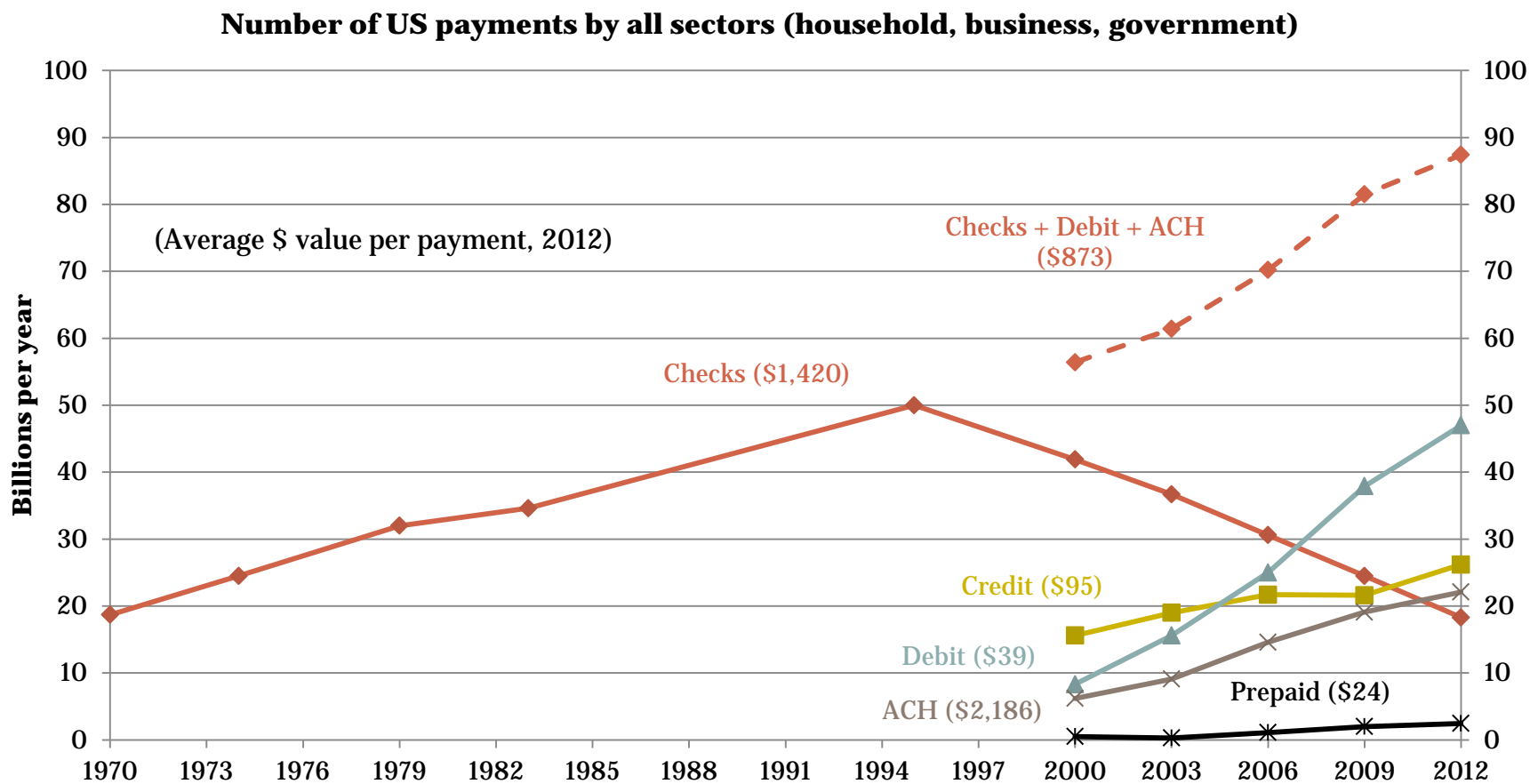
Source: Author's analysis.



U.S. money supply



Transformation of U.S. **noncash** payments: Paper to electronics (#)




Source: Federal Reserve Payment Study (FRPS).





Capital One
what's in your wallet?

 #KaCHING

Official Bank and Credit Card of the 



Consumer cash holdings and withdrawals

Dollars per consumer, except as noted

	Mean			Median		
	2011 ^r	2012 ^r	2013	2011 ^r	2012 ^r	2013
Cash holdings	337	464	508	70	69	65
On person.....	73	73	64	31	29	29
On property.....	278	401	461	13	10	9

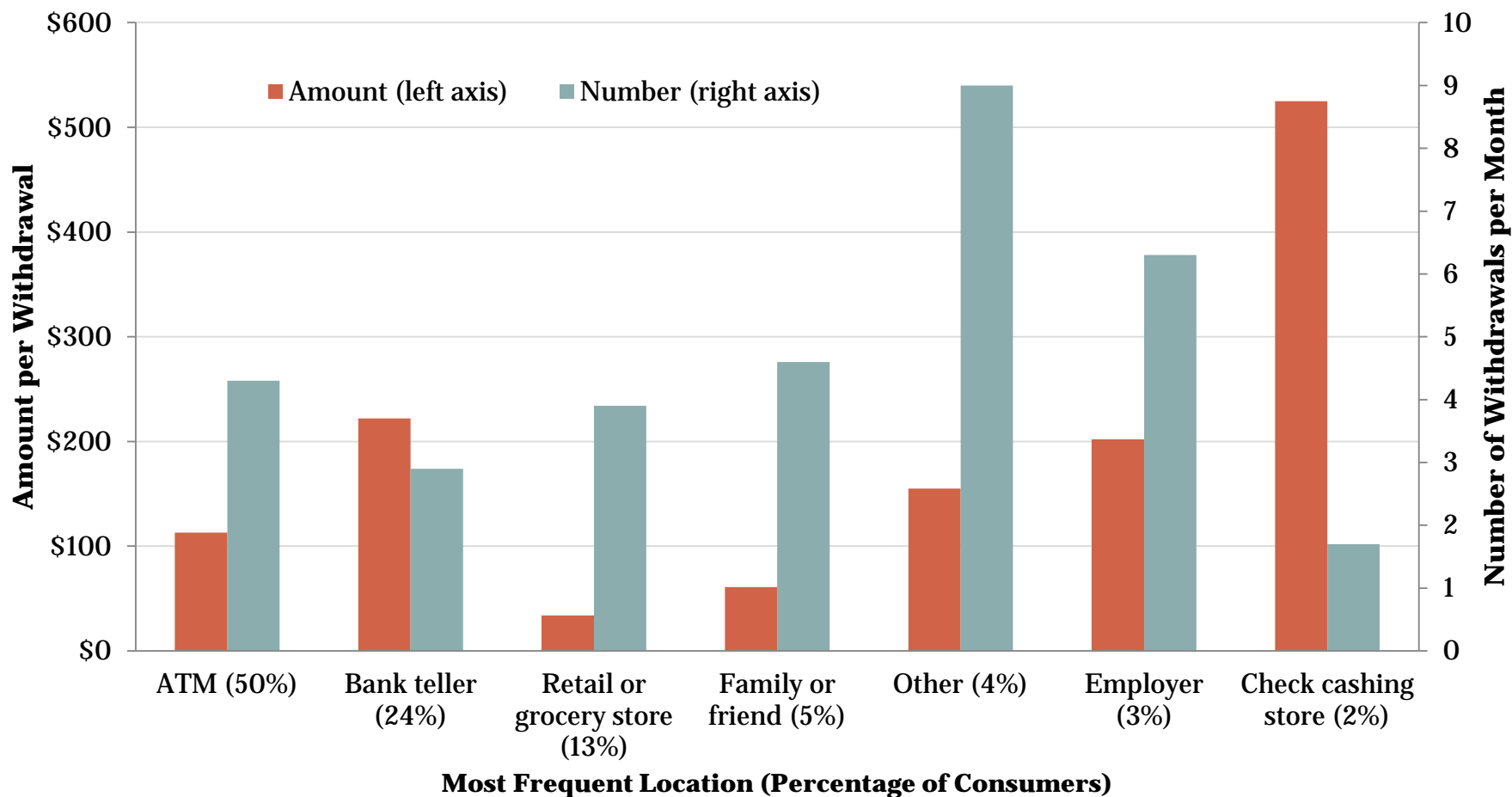
Dollars per consumer per location, except as noted*

Total	Mean			Median		
	2011 ^r	2012 ^r	2013	2011 ^r	2012 ^r	2013
Cash withdrawals per month†	526	655	686	261	280	237
Amount per withdrawal.....	129	131	124	70	74	64
Withdrawals (number per month).....	5.4	6.4	6.5	4	4	4

Source: 2011-20123 Survey of Consumer Payment Choice



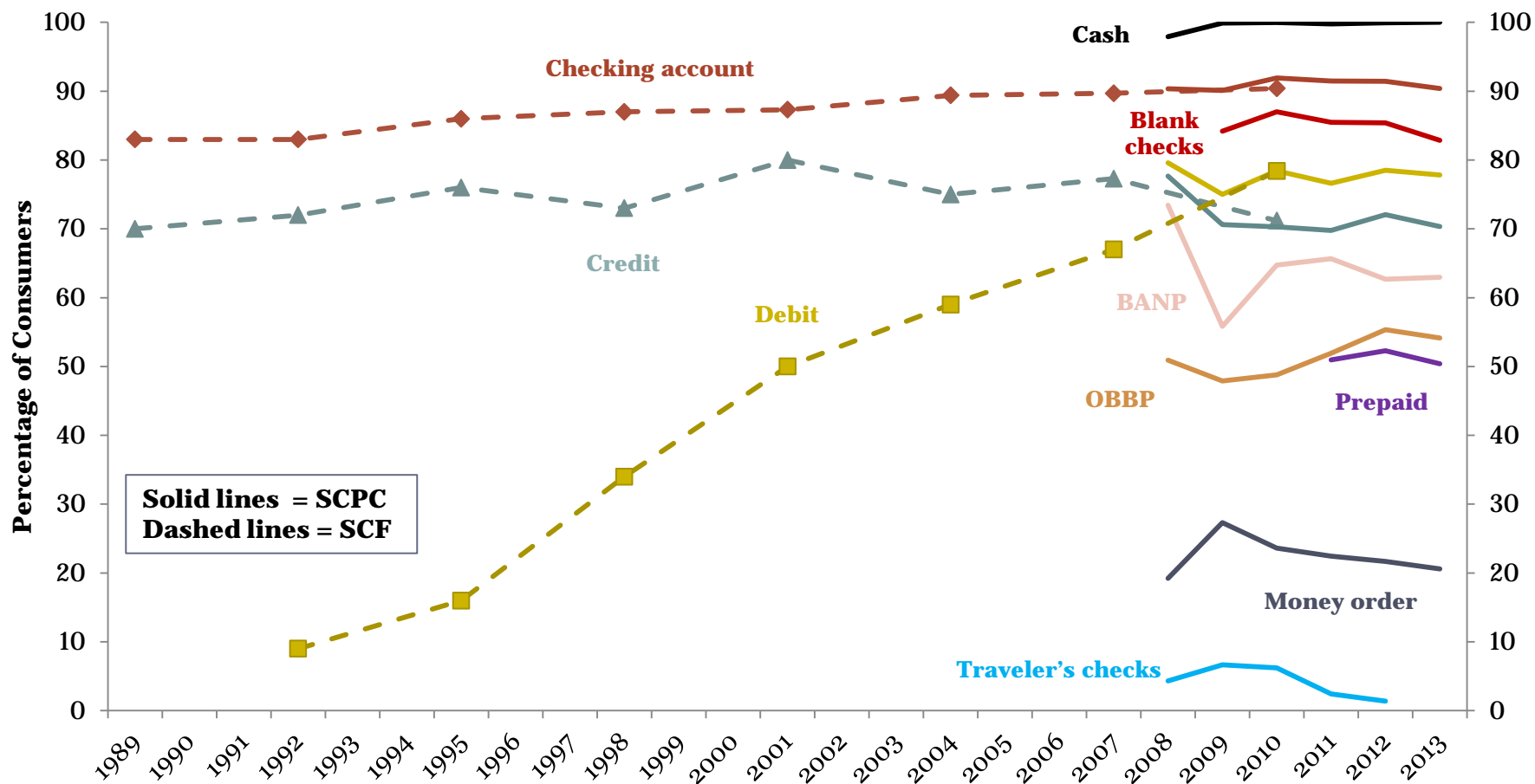
Sources of consumer cash withdrawals



Source: 2012 Survey of Consumer Payment Choice



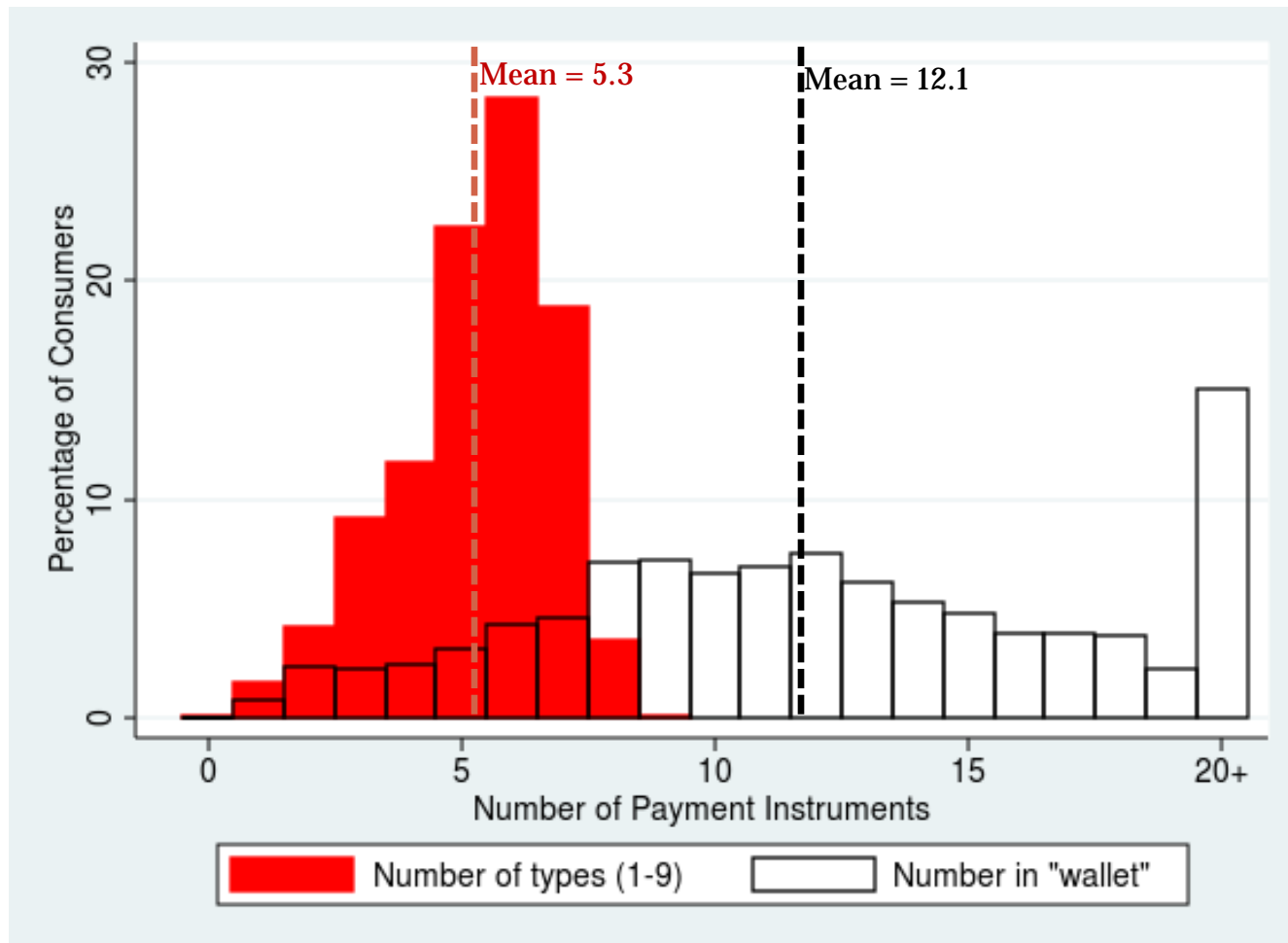
Consumer adoption of payment instruments



Source: Survey of Consumer Payment Choice;
Survey of Consumer Finance



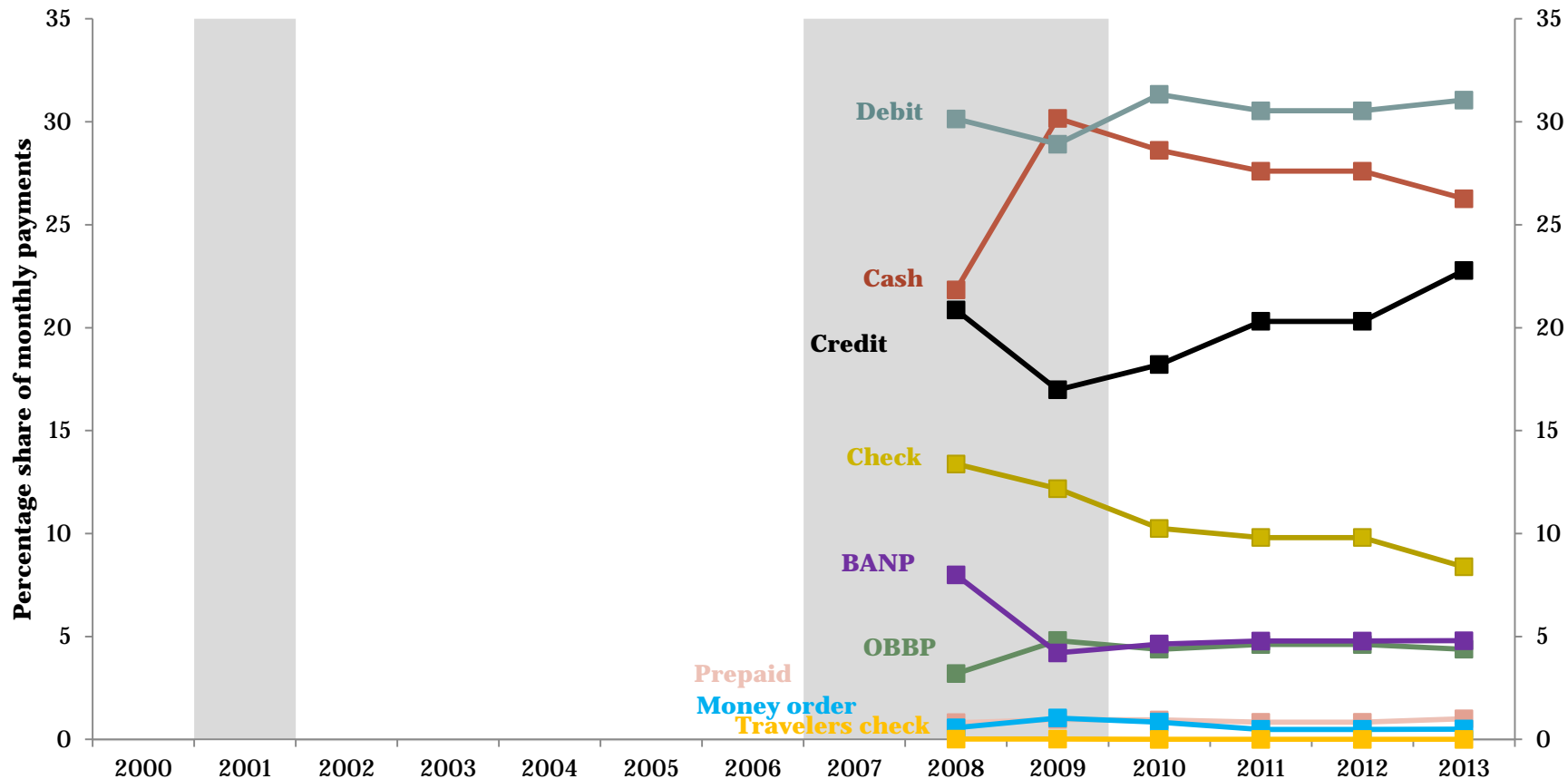
Number of instruments held by consumers



Source: 2012 Survey of Consumer Payment Choice



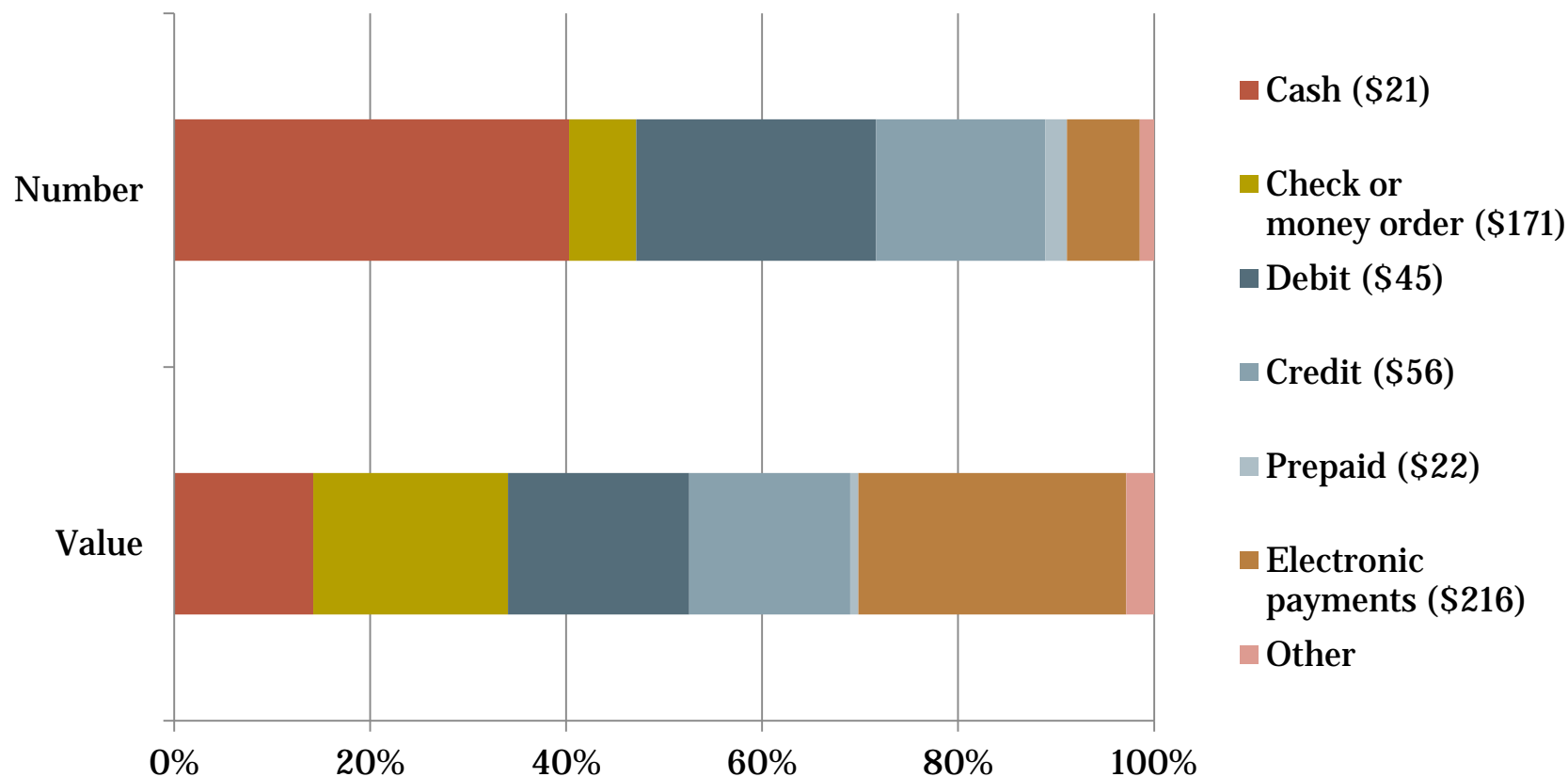
Consumer payments (from Survey)



Source: 2008-2012 Survey of Consumer Payment Choice



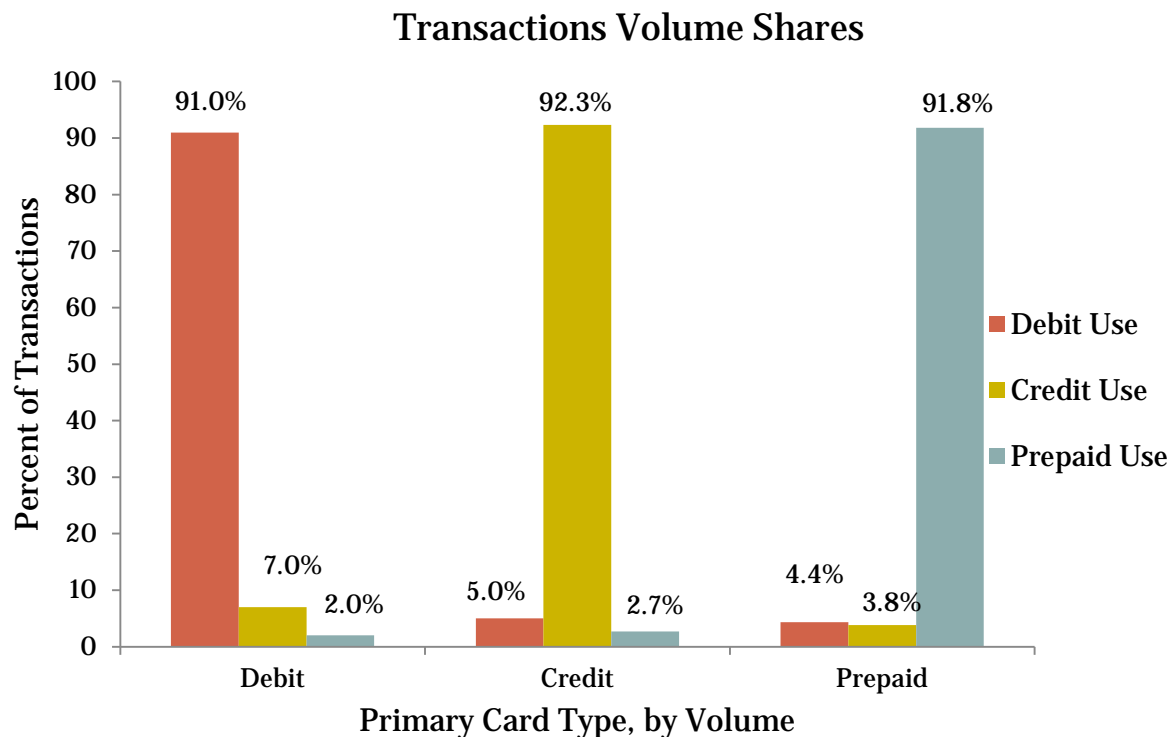
Consumer payments, 2012 (from Diary)



Source: 2012 Diary of Consumer Payment Choice (DCPC)



Consumer use of payment cards by type

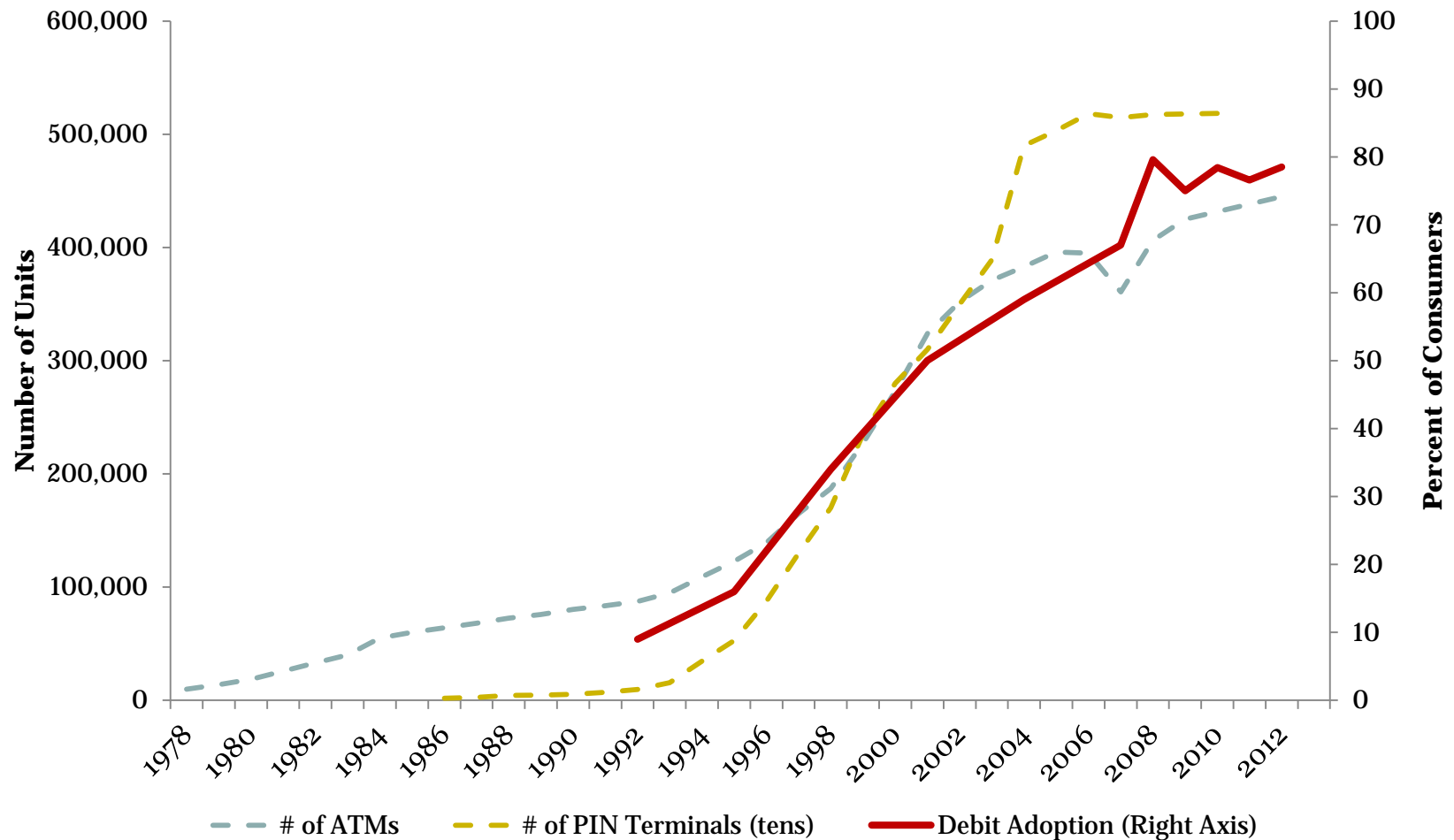


Primary cards (3-day period) as defined by highest number of transactions. *Left:* Transaction volume shares of the three cards. *Right:* Average transaction value of each card type, by primary card.

Source: Shy, Oz, 2013. "How many cards do you use?," Working Papers 13-13, Federal Reserve Bank of Boston.



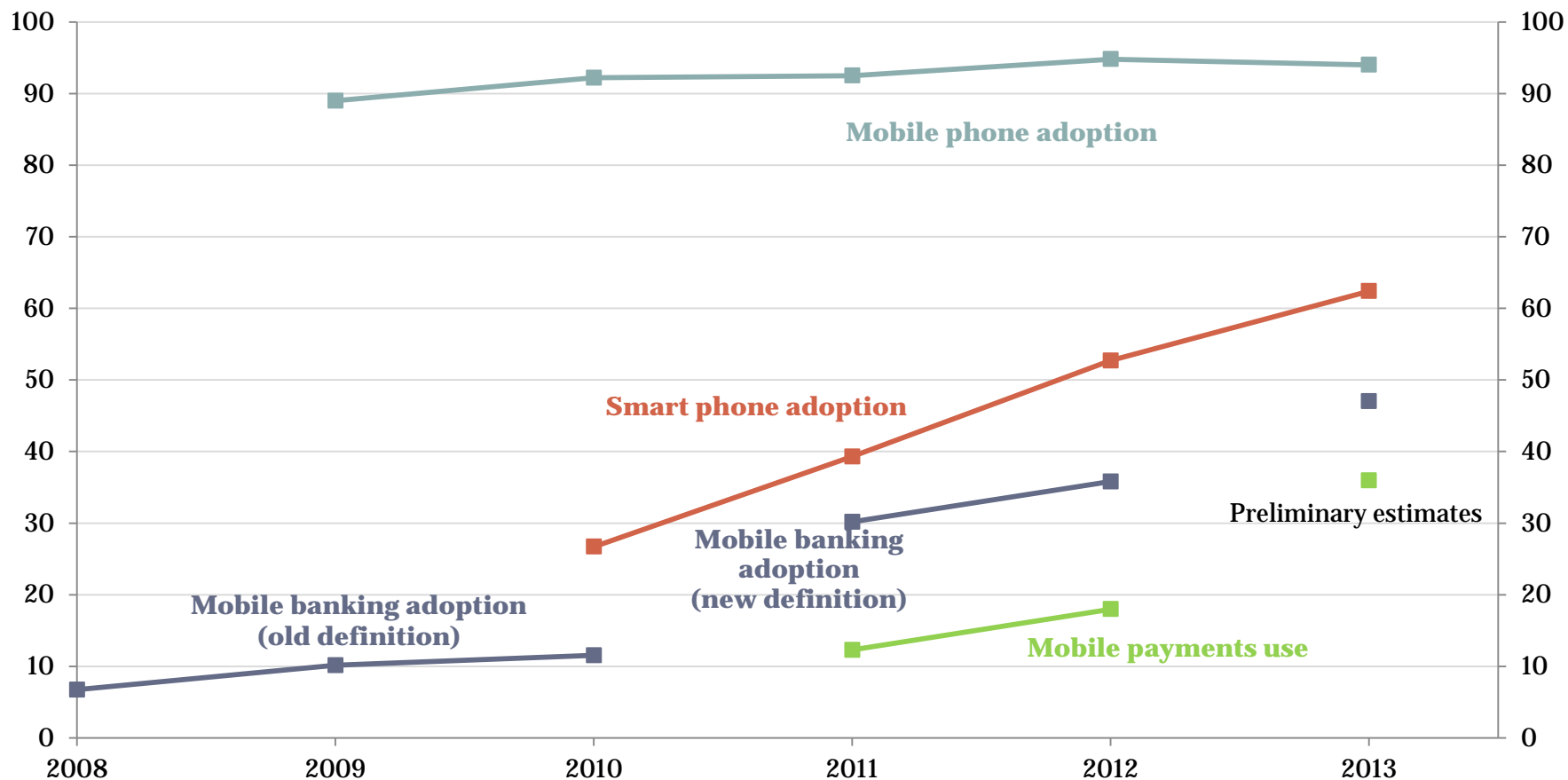
Diffusion of payment technology #1: ATMs, PIN terminals, and debit cards



Source: BIS Redbook; IBIS World; DataMonitor; Survey of Consumer Finances;
Survey of Consumer Payment Choice



Diffusion of payment technology #2: Mobile banking and payments

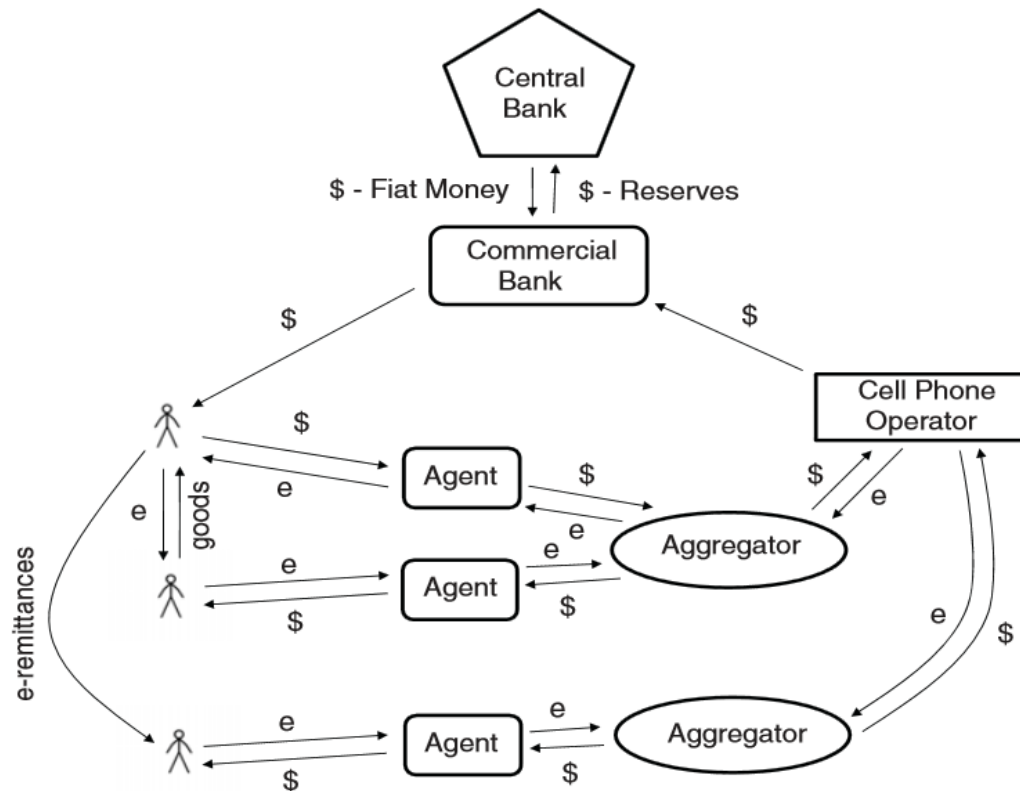


Source: 2008-2012 Survey of Consumer Payment Choice



MPESA system (Kenya, Africa)

Figure 6 Flows of Fiat Money and E-Money



Source: Jack, William, Tavneet Suri, and Robert Townsend. "Monetary Theory and Electronic Money: Reflections on the Kenyan Experience." *Economic Quarterly* 96.1 (First Quarter 2010) pp. 83–122.



Electronic Money and Virtual Currencies



Definitions

- **Electronic money (e-money)**

“...is broadly defined as an electronic store of monetary value [sovereign currency issued and controlled by the government] on a technical device that may be widely used for making payments to entities other than the e-money issuer. The device acts as a prepaid bearer instrument which does not necessarily involve bank accounts in transactions. E-money products can be hardware-based or software-based, depending on the technology used to store the monetary value.” (European Central Bank)

- **Virtual currency (VC)**

“...is a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community.” (European Central Bank)



Modern classification of money

Table 1 A money matrix

<i>Legal status</i>	<i>Unregulated</i>	– Certain types of local currencies	– Virtual currency
	<i>Regulated</i>	– Banknotes and coins and checks!	– E-money – Commercial bank money (deposits)
		<i>Physical</i>	<i>Digital</i>
		<i>Money format</i>	

Source: ECB.



Comparison of e-money and VC

Table 2 Differences between electronic money schemes and virtual currency schemes

	Electronic money schemes	Virtual currency schemes
Money format	Digital	Digital
Unit of account	Traditional currency (euro, US dollars, pounds, etc.) with legal tender status	Invented currency (Linden Dollars, Bitcoins, etc.) without legal tender status
Acceptance	By undertakings other than the issuer	Usually within a specific virtual community
Legal status	Regulated	Unregulated
Issuer	Legally established electronic money institution	Non-financial private company
Supply of money	Fixed	Not fixed (depends on issuer's decisions)
Possibility of redeeming funds	Guaranteed (and at par value)	Not guaranteed
Supervision	Yes	No
Type(s) of risk	Mainly operational	Legal, credit, liquidity and operational

Source: ECB.



Payments with bitcoin & virtual currencies



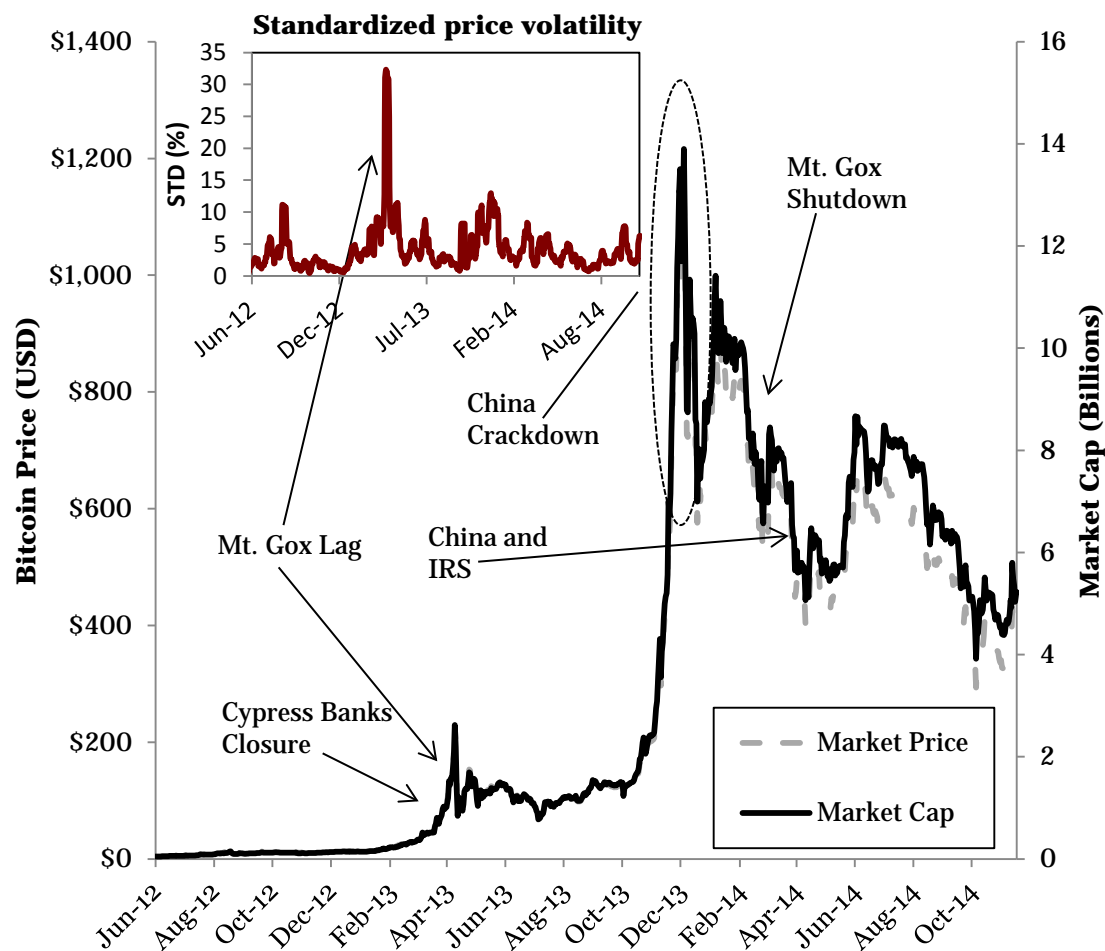
Technology/payments

- **Bitcoin** is a payment system
 - Acceptance is low but growing
 - Cost is nearly zero for each transaction
- **Bitcoin** is open source/standards based, nearly anonymous exchange, very secure, and ubiquitous (Internet)
- There are more than 300 virtual currencies, e-money, and digital payment technologies
- Canadian MintChip experiment uses similar technology for small-value Canadian payments

Money/banking

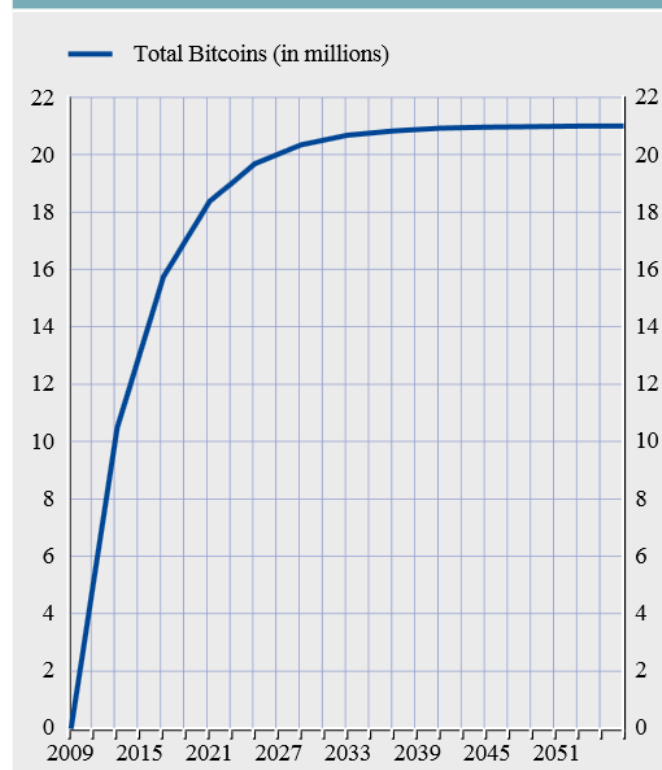
- **bitcoin** is money – “collaborative,” private, and electronic (“virtual”); called currency but NOT legally (yet)
- **bitcoin**/VC payments are low-cost but offer new revenue opportunity
- Money has value and risk of theft so new banks are emerging to store and manage **bitcoins**/VCs
- Traditional banks are constrained in holding VCs by BSA/AML regs
- If VCs take hold, they will provide new incentives to create money (despite promises not to)

Data on bitcoin price and quantity



Source: <http://blockchain.info/charts>

Chart 5 Total Bitcoins over time



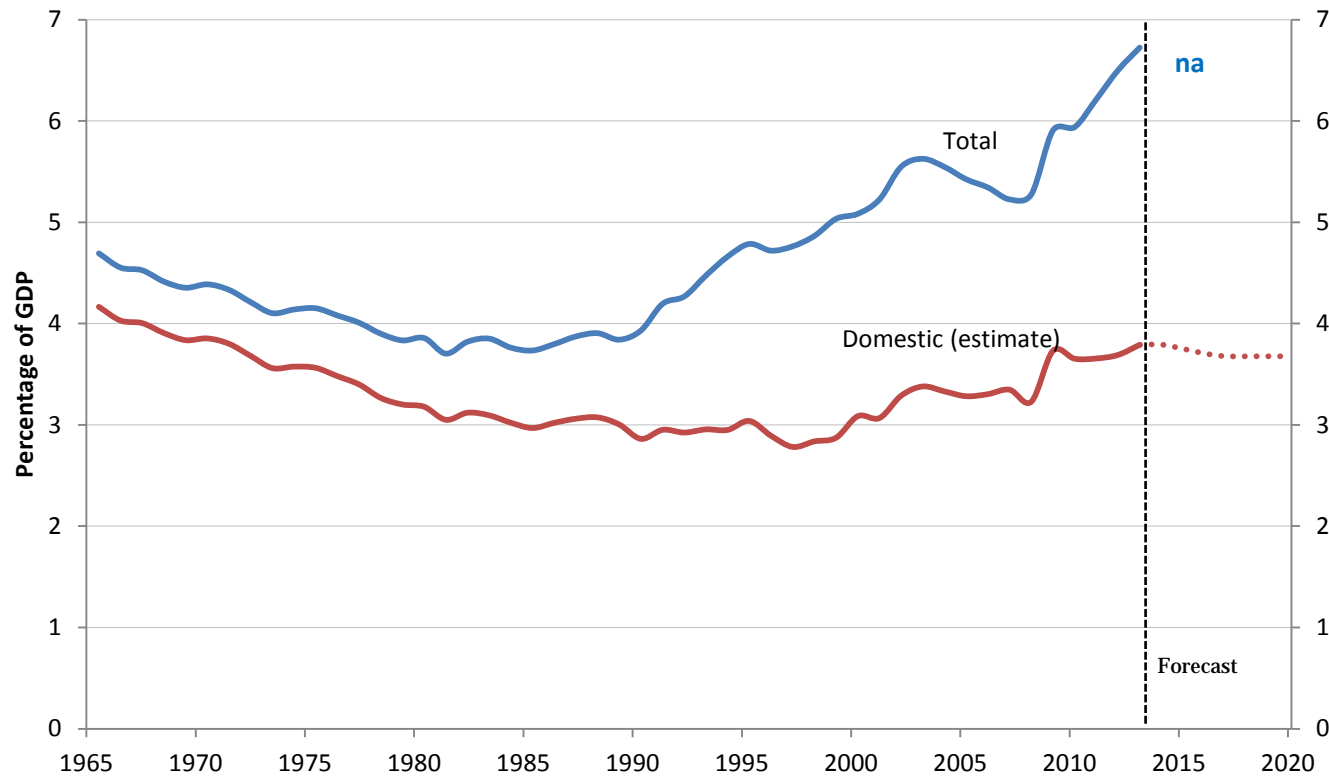
Source: ECB



The Future of Money, Payments, and Banking



U.S. domestic demand for cash should moderate as interest rates rise

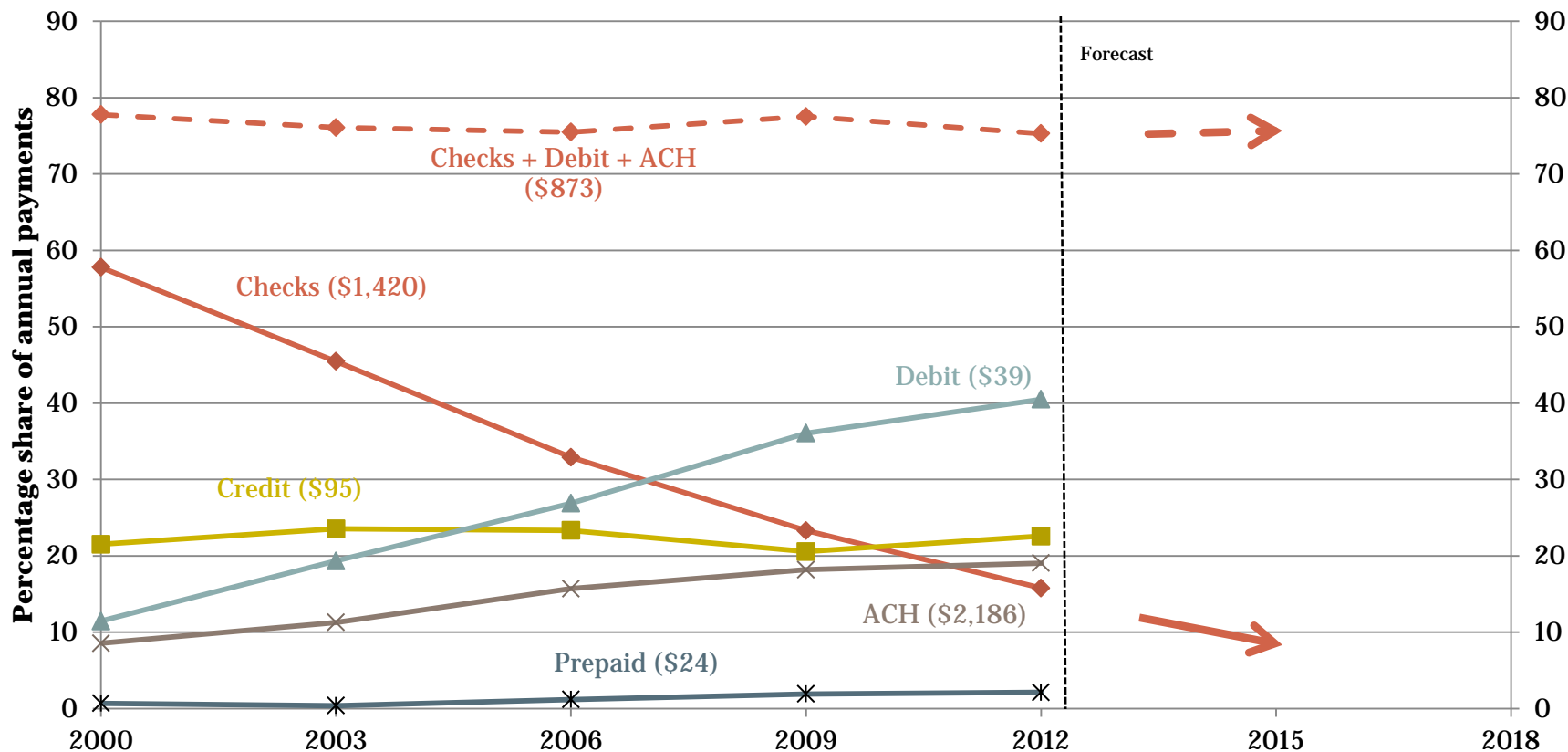


Source: Bureau of Economic Analysis / Haver Analytics, Federal Reserve Board / Haver Analytics, authors' calculations.



Forecasts of U.S. **noncash** payments: Paper to electronics (shares)

Share of US payments by all sectors (household, business, government)



Source: Federal Reserve Payment Study (FRPS); values in parentheses are from 2012.



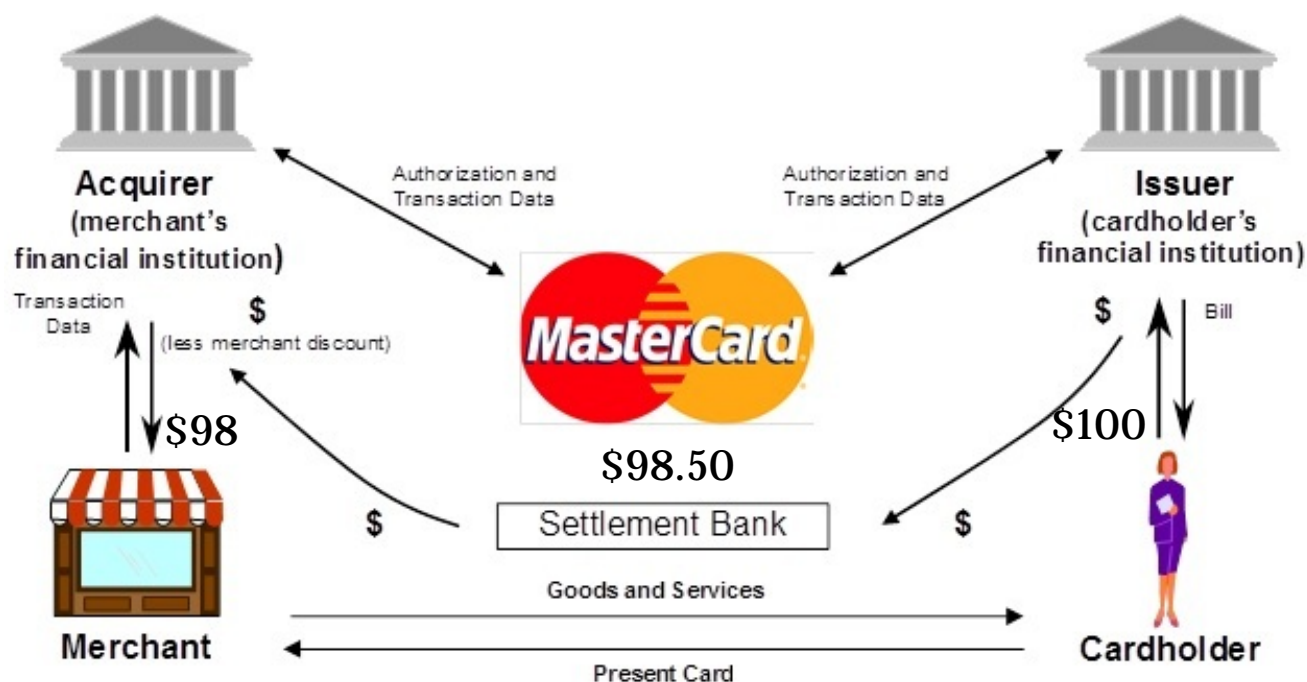
Federal Reserve 2012-2016 strategic plan

- *Planned improvements to U.S. payment system*
 - **Faster** – reductions in ACS and notification times
 - ✦ To legacy payment systems?
 - ✦ And/or a new system like U.K. Faster Payment Service?
 - **Safer** – reductions in fraud, loss, and data breaches
 - ✦ EMV finally implemented?
 - ✦ Improved cyber security?
 - **More attentive to preferences of end users**
 - ✦ Consumers, businesses, nonprofits



Large revenues in payment card networks

Typical Point of Interaction Card Transaction



New policies affecting payment cards

2010

- Opt-in overdraft protection (Fed)

2011

- Debit interchange fee capped at 25 cents (Fed)
- Discounting and card fee disclosure (DoJ)
- Propose fees on debit cards (some banks)

2012

- Proposed rules, prepaid cards (CFPB)

2013

- Proposed rules, student cards/accounts (CFPB)
- Credit card surcharging (District Court ruling)

2014

- Overdraft fees and debit cards (CFPB)
- Prepaid card fee disclosures (CFPB)

Traditional banking faces strong competition

Market for Payment Services

Market for Lending Services

Nonbank payment services

PayPal,
NetSpend,
Bluebird,
Google
Wallet,
Amazon
Payments,
Square

TRADITIONAL BANKS

Take
Deposits

Make
Loans

(fractional reserve)

Nonbank loan services

Peer-to-peer brokers
Prosper, Lending Club, SoFi,
Funding Circle, ZOPA

Microfinance
Kiva, Microplace, Micro
Credit Enterprises, Accion

Payment Card
Networks and
Processors

"Narrow" Banks

Green Dot

(full reserve)

none?

PUBLIC MONEY (\$)

VC DI's

VC payment
networks
(Bitcoin, etc.)

Ripple, Circle,
Coinbase, etc.

none?

PRIVATE MONEY (?)



Thank You!



- **Please complete evaluation**
 - Collection outside Connolly Center
- **Lunch**
 - New England Room, 4th Floor
- **Breakout Sessions 1:15, 2:15, and 3:15**
 - Third Floor AV Lounge