

Payments in the US: the evolution continues

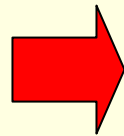
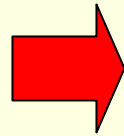
Jim Cunha
Senior Vice President
Federal Reserve Bank of Boston
TAWPI Forum & Expo
August 13 2007

Agenda



- Evolution of payments
 - What can we learn from other industries?
 - The rise & fall of paper-based payments
 - The Fed's response to payments system change
 - The broader payment landscape
- Role of the Treasury in the evolution
 - Past
 - Future

The transition of America from a paper-intensive payments system to an electronic one



A wicked quick guide to navigating Bahstun

- Language
- Getting around

Wicked

- Wicked:
 - "very" - wicked nice check sorter you have there.
 - "very good" - wicked check sorter you have there

Cah



Bia



Fia



Tonic



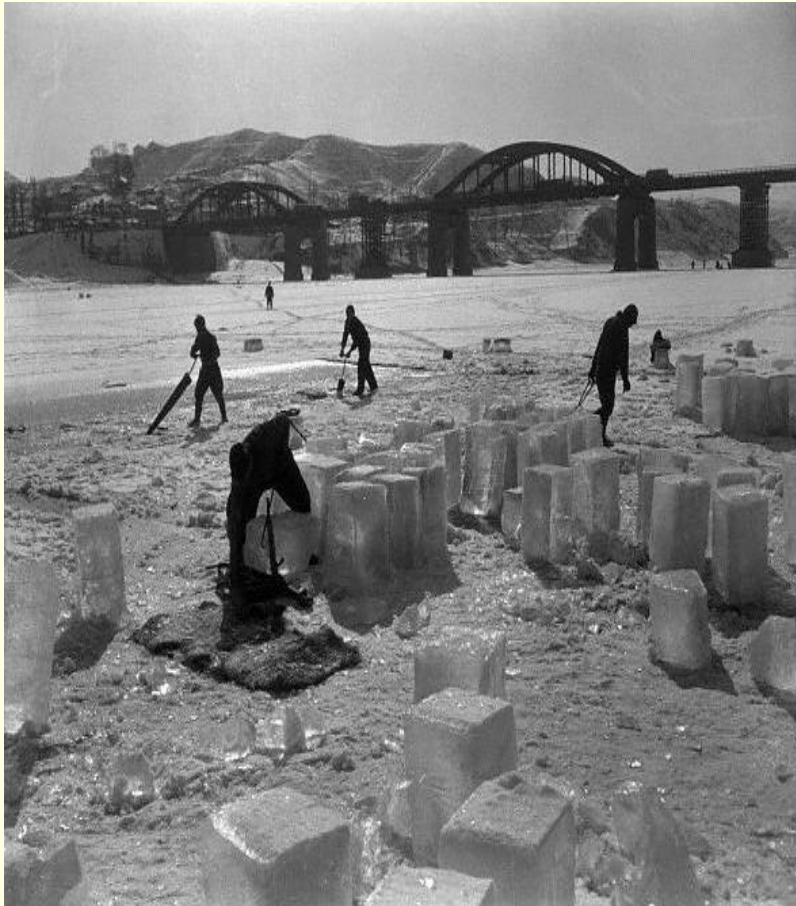
"Helpful" signs



The Sox



Lets talk about ice harvesting and refrigeration instead

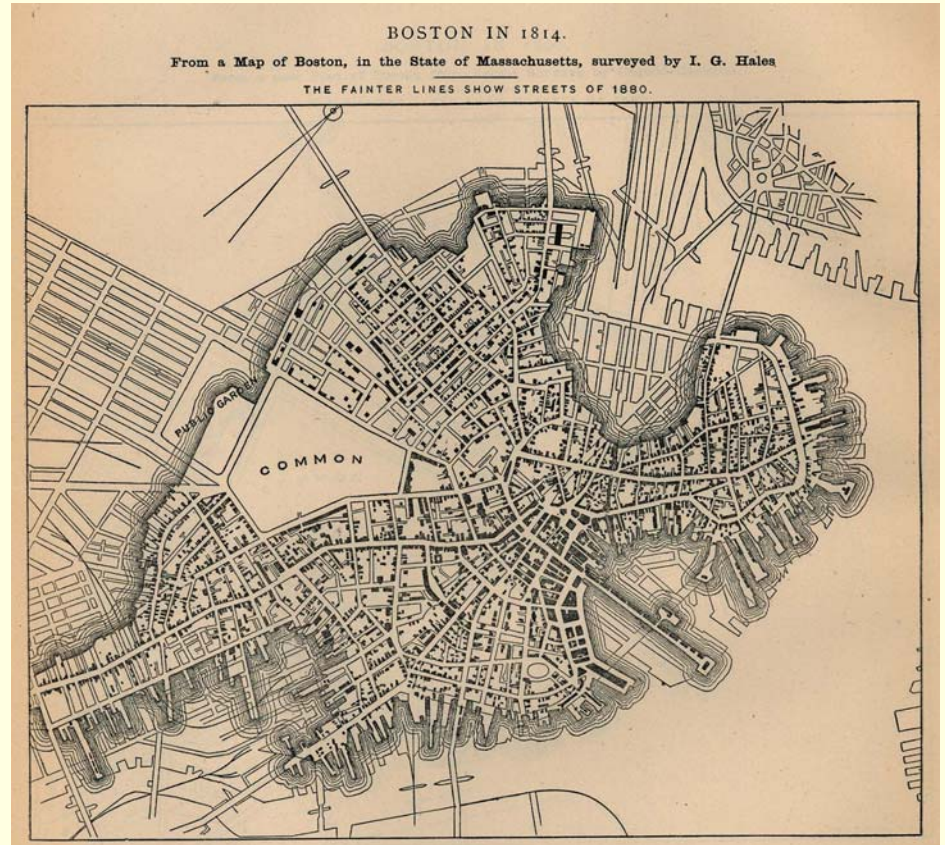


Refrigeration is *relevant*

For parochial reasons



It is wicked hot outside today



The commercial *natural ice* business was invented in Boston

We only notice refrigeration when it's busted



When the ice machine is broken



When the office air conditioner is on the fritz



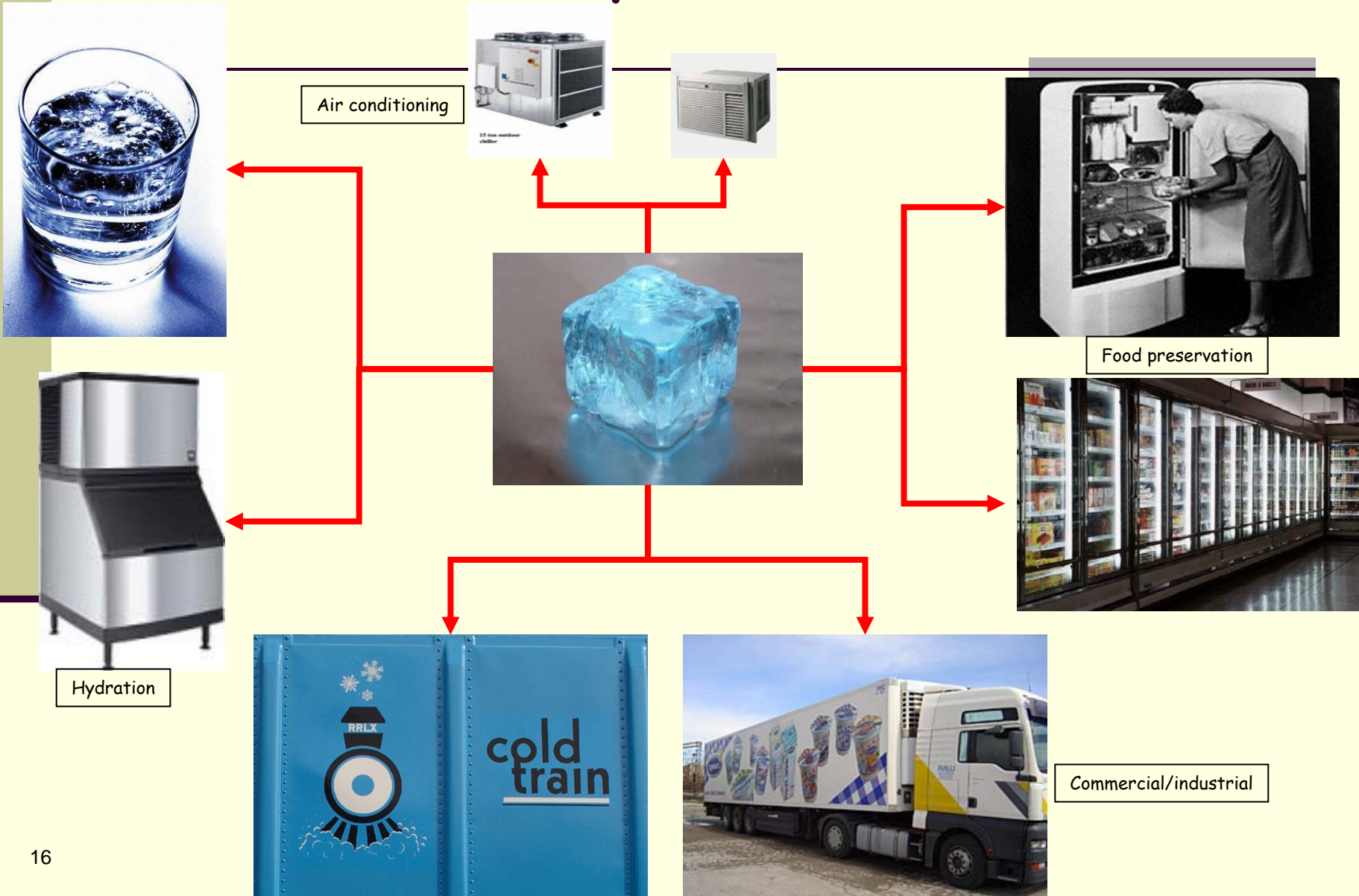
When you have to defrost the freezer

Consumers only notice the payments system when it's busted



When your bank or credit card statement is wrong or payments don't flow

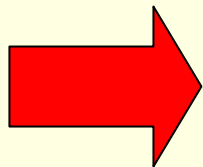
Refrigeration and payments are both complex businesses with many facets



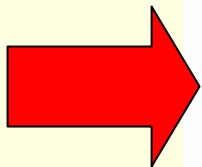
Refrigeration and payments have long histories



1530



1890



2007

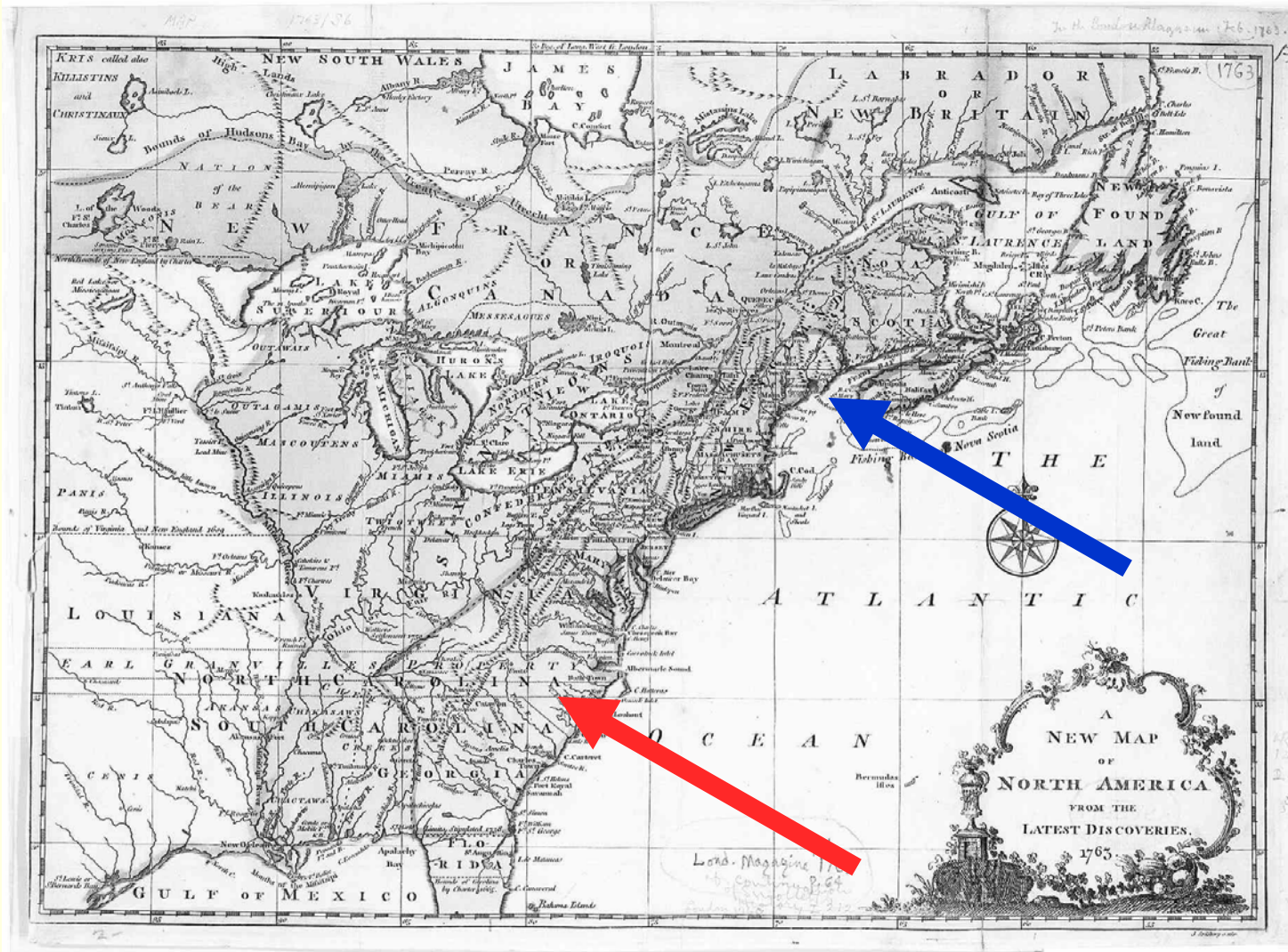
Natural ice was once a huge business in the US, but is now mostly forgotten



Check is still a pretty big business in the US, someday to be forgotten.



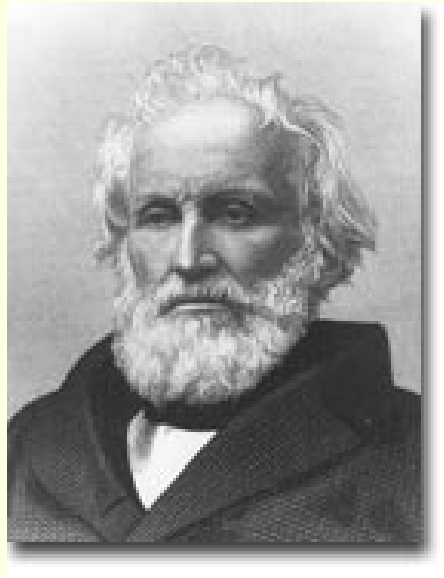
Ice in the 18th century



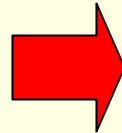
Ice in the mid-19th century



Early-American millionaires



Frederick Tudor
the *Ice King*



Ice in the mid-19th century



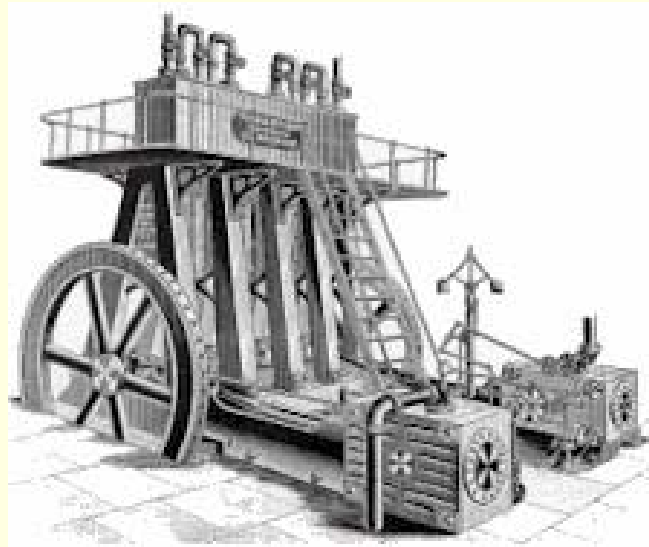
Ice in the mid-19th century



Ice in the late-19th century



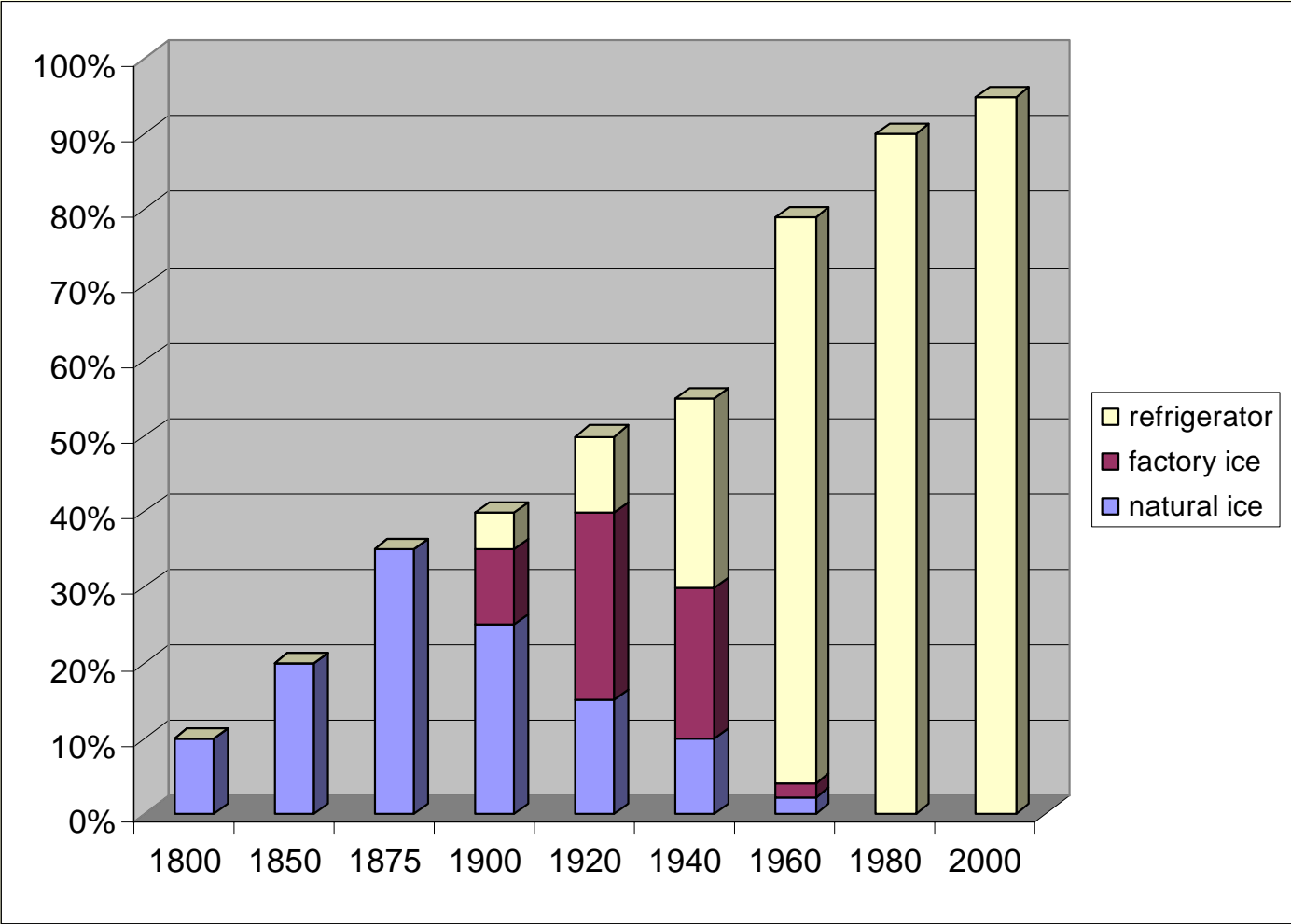
Early 20th century - factory ice production replacing harvested ice



Ice after WWII



Cycles of refrigeration



Household access to year-around refrigeration, 1800-2000 (hypothetical)

What happened with natural ice?



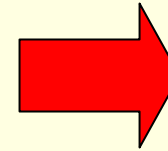
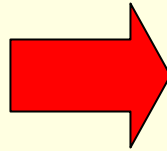
People did not realize *natural ice* was reaching its peak in the 1890s



And they did not know where refrigeration was going or going to go in the future

The Good News

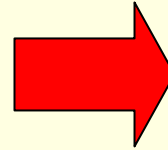
Access to year-around refrigeration increased dramatically



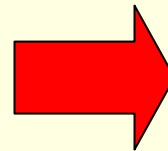
Household access to refrigeration went from about 25% in 1910 to 100% in 1990

The Good News

Refrigeration made the *world a better place*



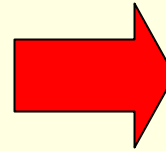
Weekly shopping instead of daily shopping



Year-around access to fresh "seasonal" foodstuffs

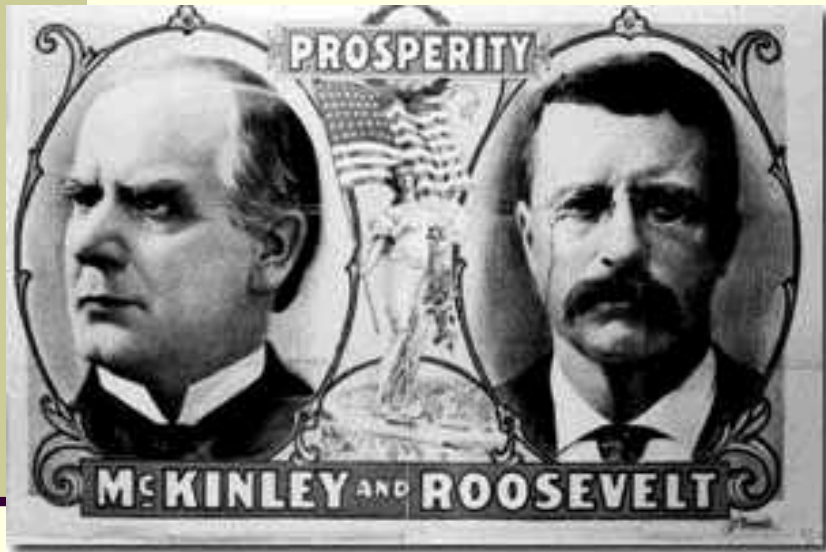
The Good News

Refrigeration made the *world a better place*

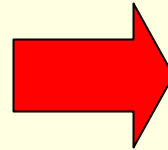


The Good News

Natural ice took 50 years from peak to trough



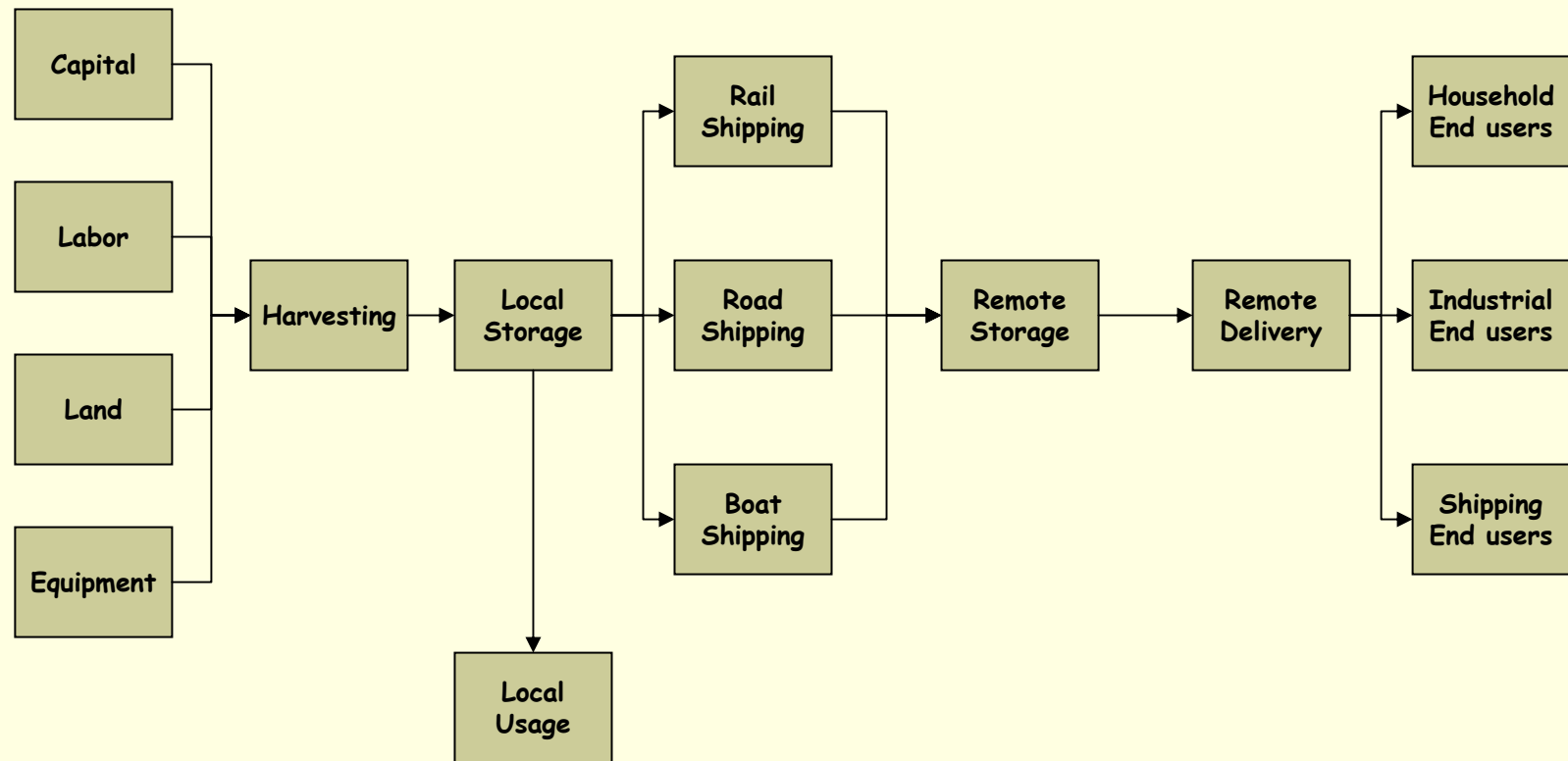
1890's



1948

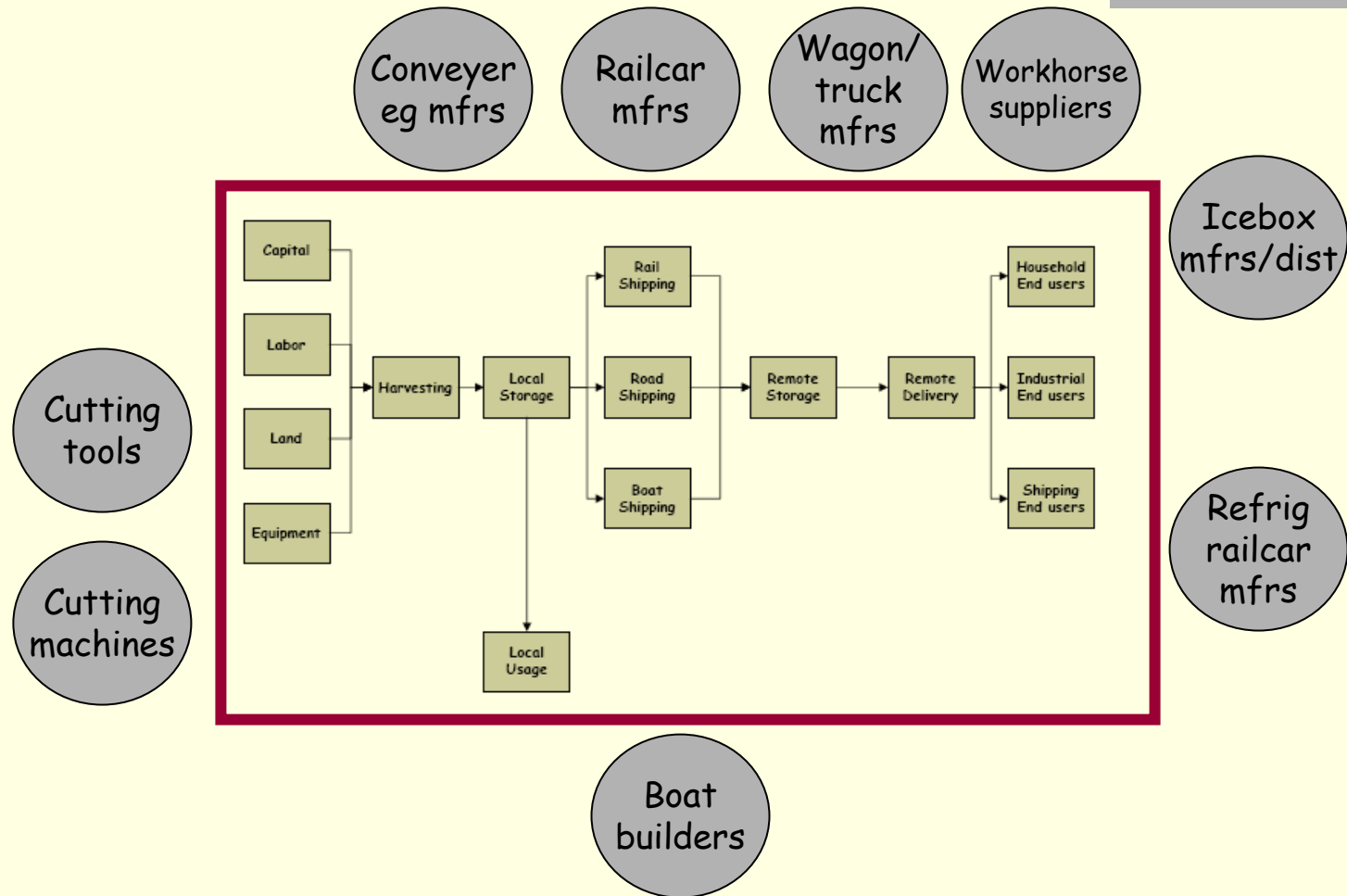
But, it's hard for a complex supply chain to react to change

The functional equivalent of what many of us do in payments



The natural ice supply had primary & secondary players

Likewise, resembling the structure of the payments industry today



The substitution away from natural ice was a crushing experience for some



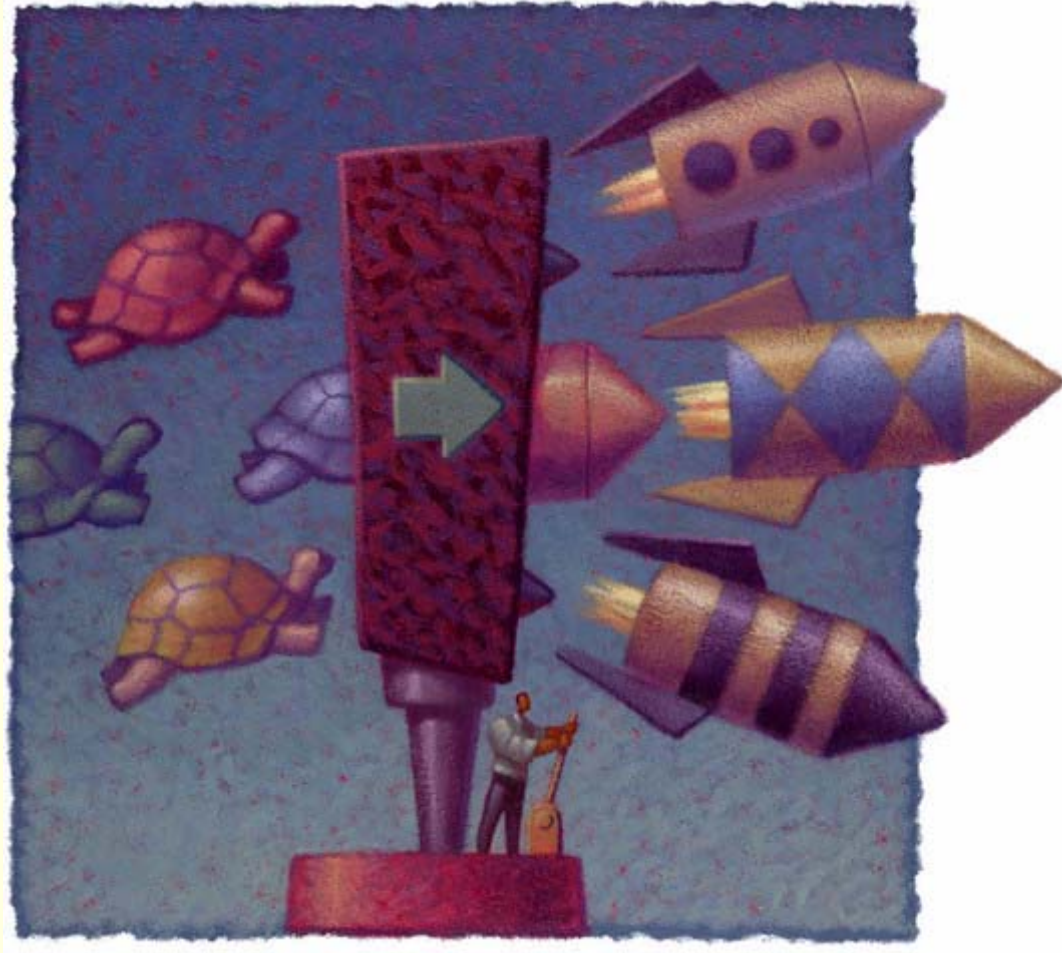
Industrial-scale harvesting



Industrial-scale inter-regional shipping

The survivors did not stand still

They adopted the full range of "usual" strategies



But was accommodated by others



Icebox manufacturers/distributors



Delivery of block ice

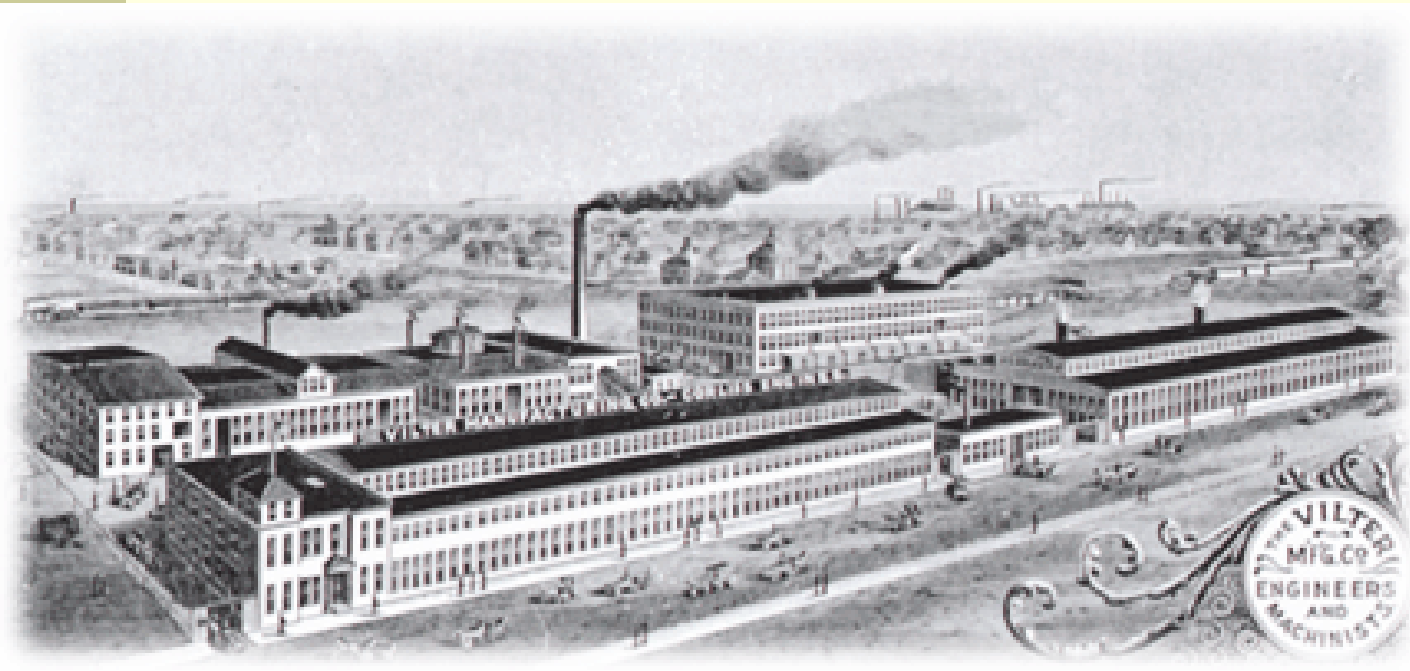


Small producers in local markets

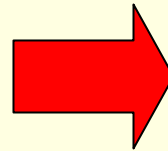
Harvesters consolidated



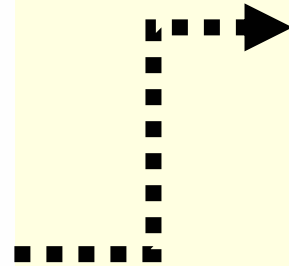
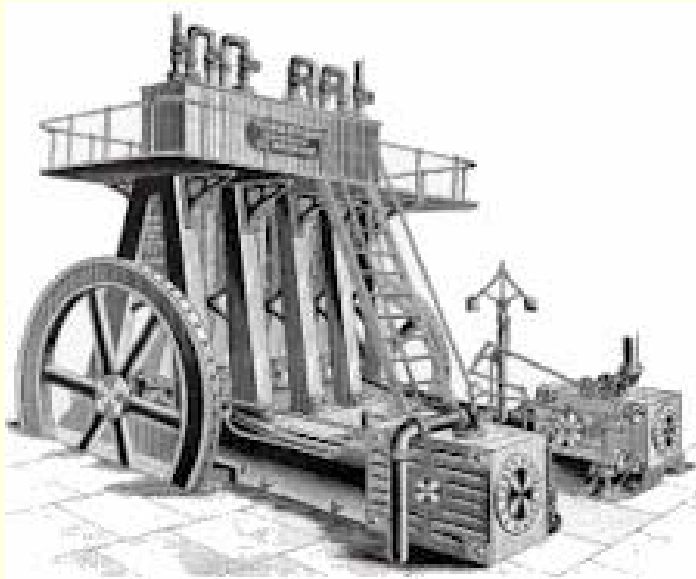
Distributors in other markets went into the manufactured ice business



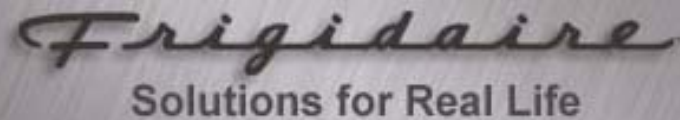
Icebox manufacturers eventually invested in refrigerator manufacturing/distribution



Manufactured ice experts eventually went into the air conditioning business



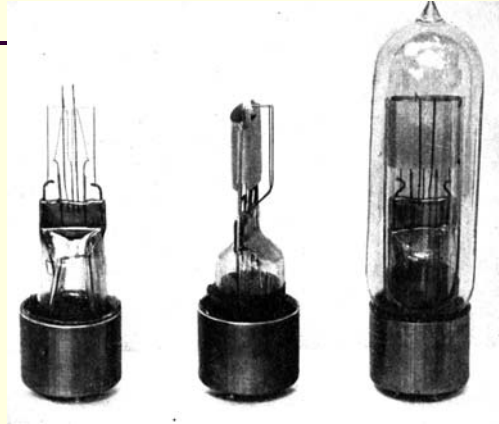
A few companies that arose at the tail-end of natural ice dominance are still around

The Electrolux logo features a stylized 'E' icon on the left, followed by the word 'Electrolux' in a bold, black, sans-serif font.The Frigidaire logo consists of the word 'Frigidaire' in a cursive script font, with the tagline 'Solutions for Real Life' in a smaller, sans-serif font below it.The Carrier logo features the word 'Carrier' in a white, serif font, centered within a blue oval shape.

History of refrigeration - recap

- Capital intensive business
- Complex infrastructure and supply chain
- An evolution filled with innovation and continuous improvement - one big revolutionary step
- Peak was not seen until decline had started
- Then, projections that ice harvesting would disappear quickly premature
- Supply chain adapted or disappeared

What happened to natural ice has happened repeatedly in recent history



Vacuum tubes - 1950s



Pagers - 1990s



Mag-tape - 1990s



Analogue mechanical watches - 1970s

What is happening with payments?

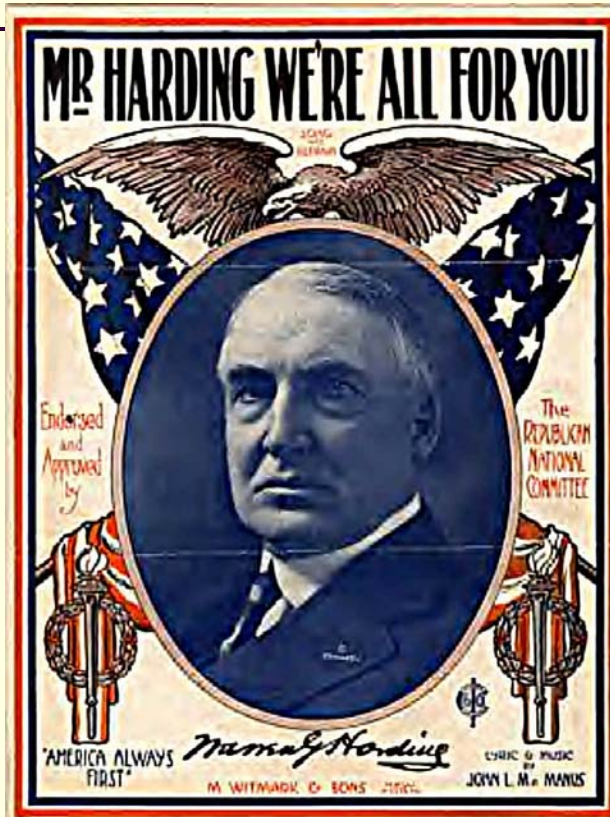


We too face good news & bad news

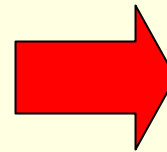


Paper substitution is not new

Cash has been declining (in relative terms) for 90 years



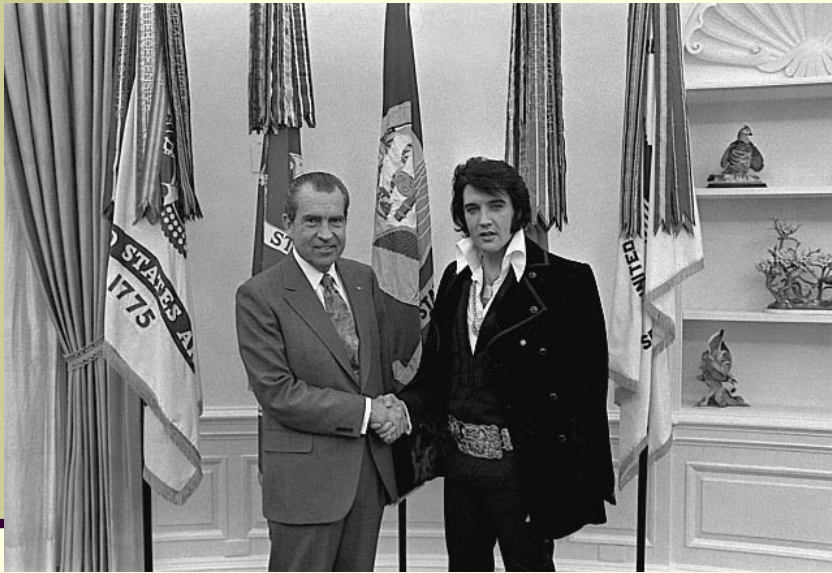
1920



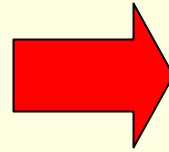
2007

Paper substitution is not new

Check has been declining (in relative terms) for 35 years



1972



2007

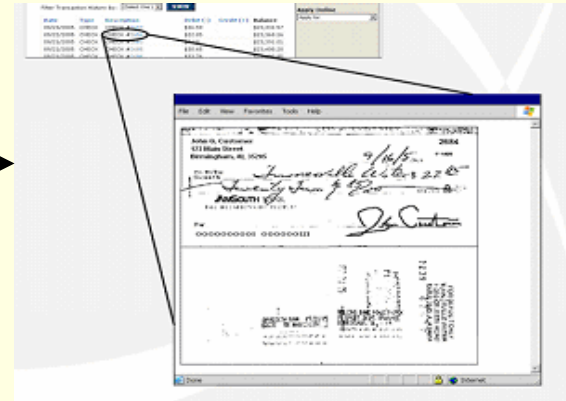
Reports of Check's demise were premature

- ABA sets up a Checkless Society Subcommittee
- Rand Corp published "Privacy Aspects of the Cashless and Checkless Society"
- Well respected Fed Governor lectures widely on his vision for a checkless and cashless society

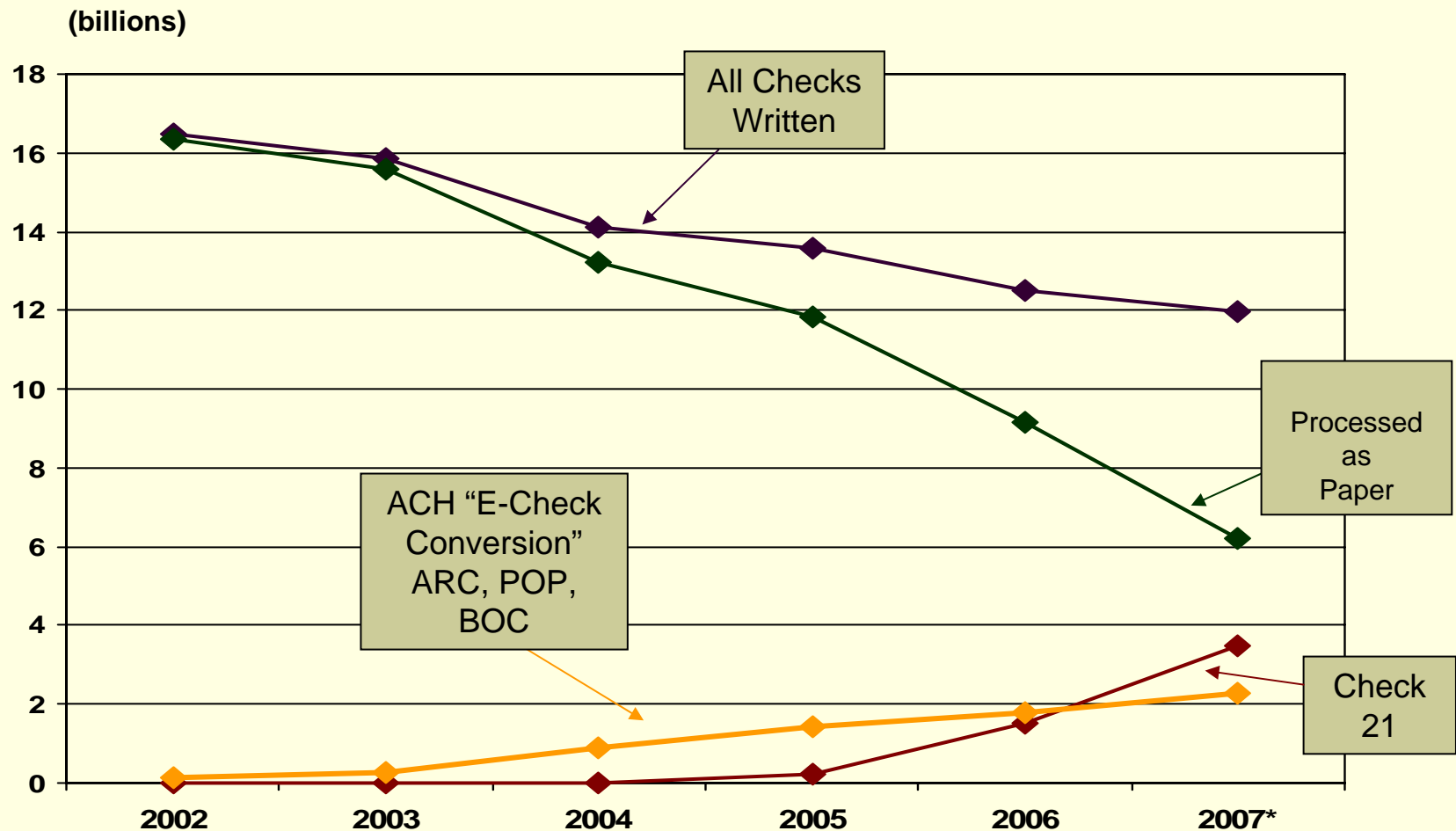
Reports of Check's demise were premature

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- Rand Corp published "Privacy Aspects of the Cashless and Checkless Society" **1968**
- Well respected Fed Governor lectures widely on his vision for a checkless and cashless society - **George Mitchell 1960's and 70's.**

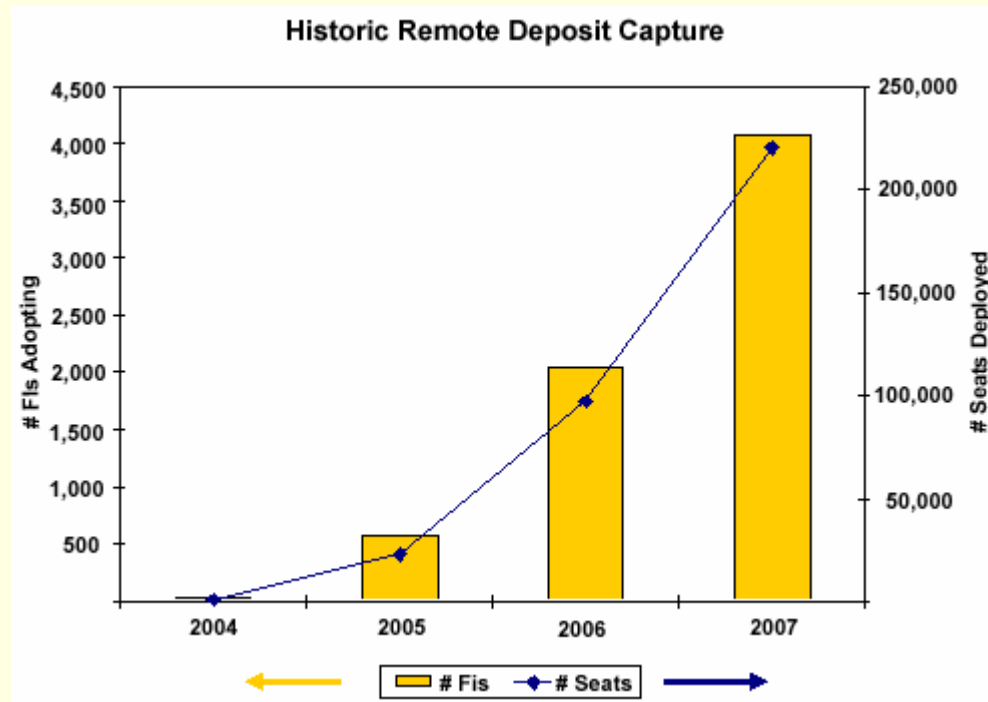
So where are we today: harvesting natural ice, manufacturing ice, or using refrigerators?



Impact of electronification on checks processed : Federal Reserve volumes only



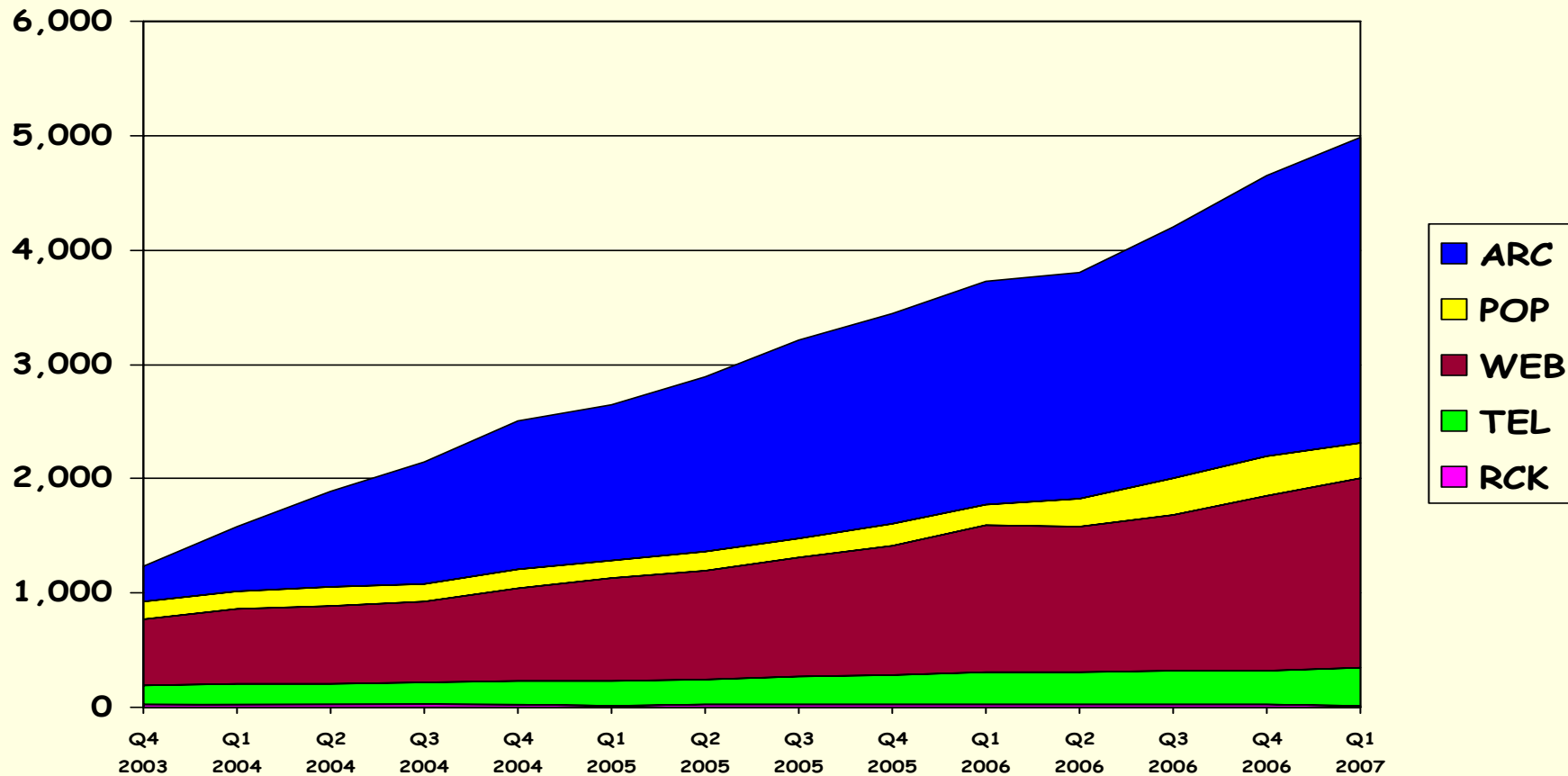
Stop paper at remote deposit site



Source: Celent 6/4/07 "State of Remote Deposit Capture" Report

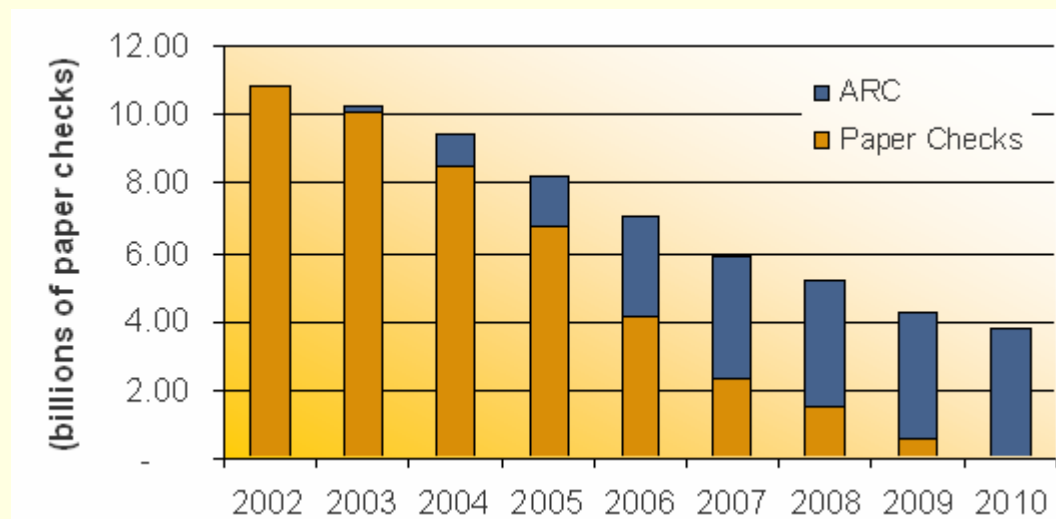
ACH E-Check volumes

Q4 2003 - Q1 2007 (annualized, in millions)



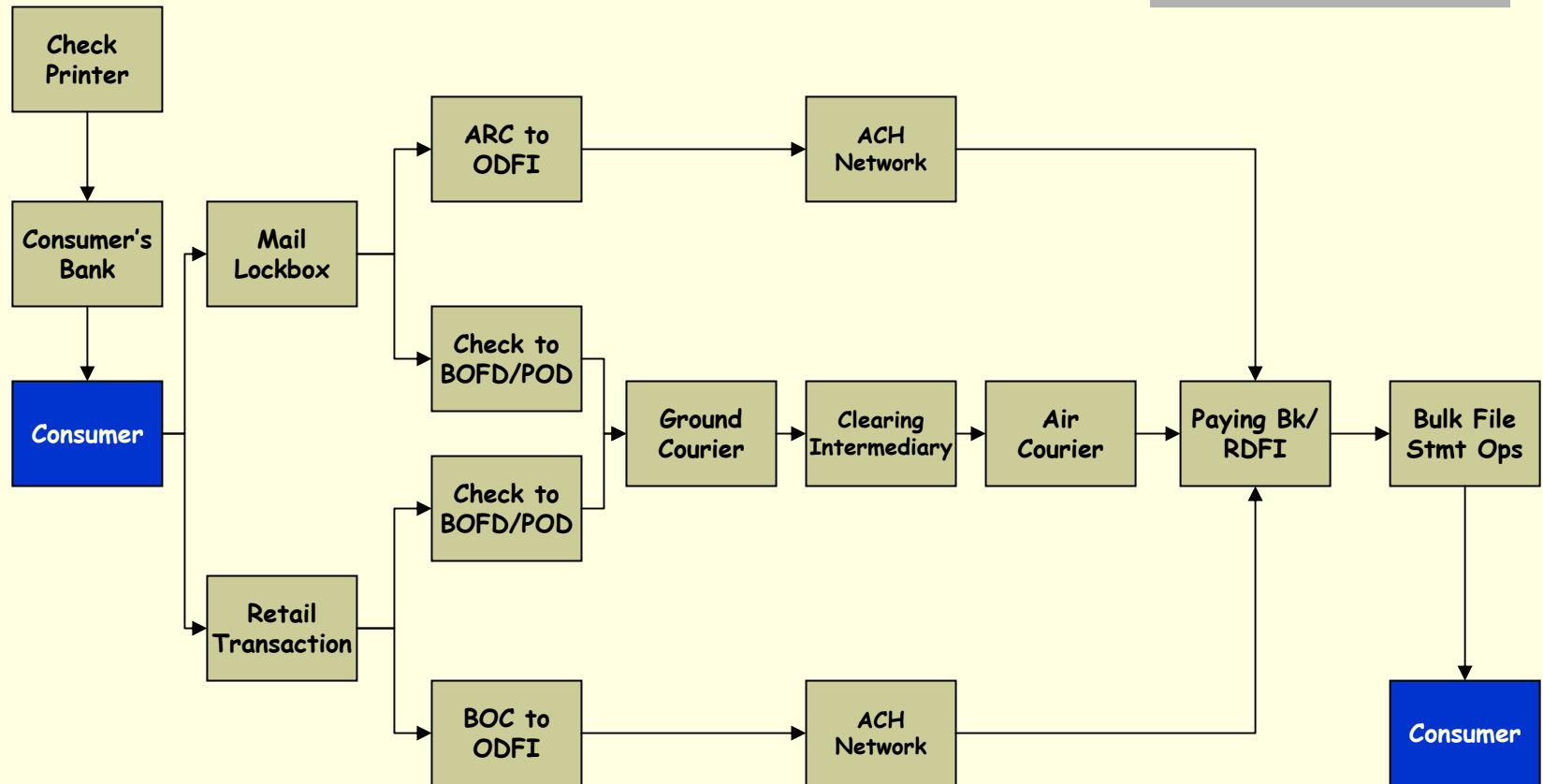
Payment Trends: ARC - Accounts Receivable Conversion

Bill Payments - Paper Check and ARC (received in a lockbox)



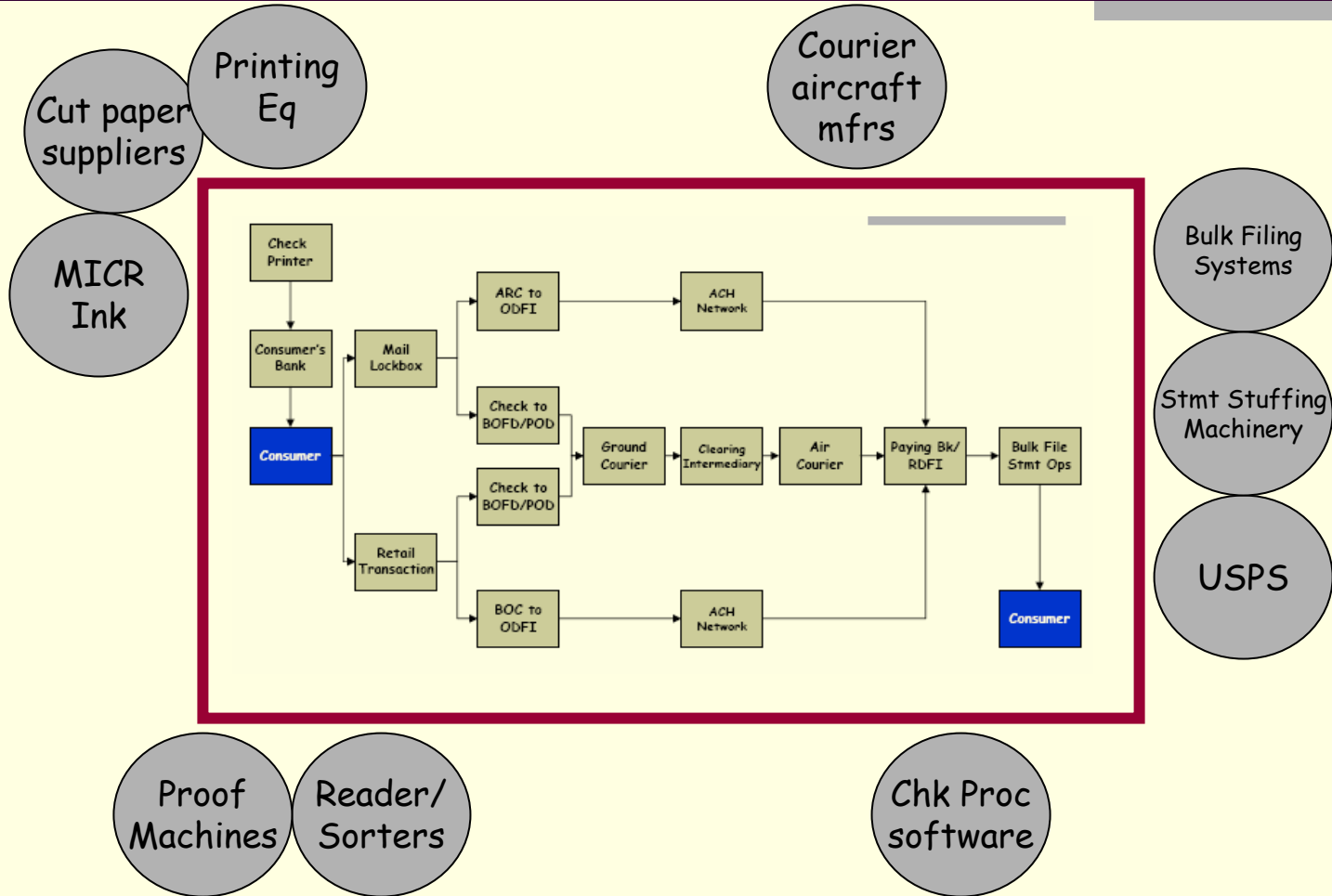
SOURCE: NACHA and Celent Communications

What is happening & will happen with the payments supply chain, us?



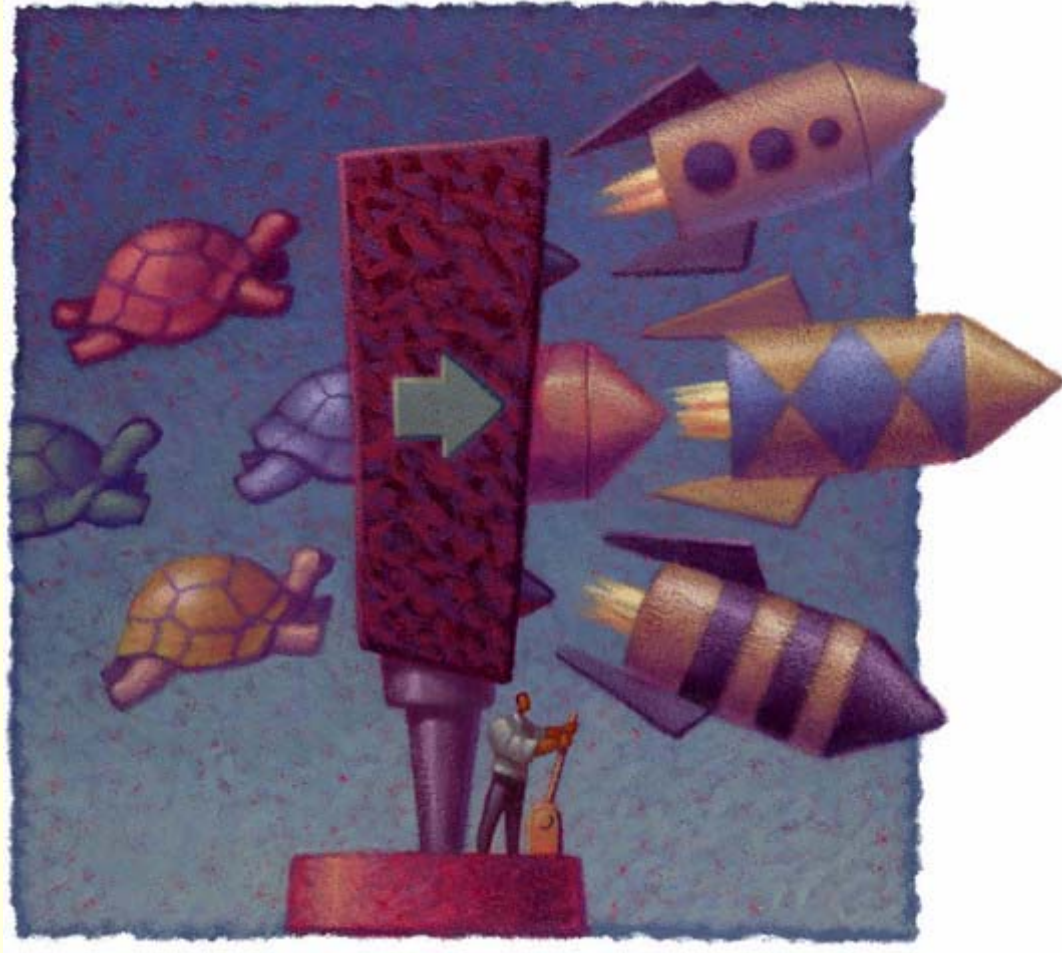
The decline of paper will affect different parts of the processing chain differently

Including the primary & secondary players ...



Those who hope to survive cannot stand still

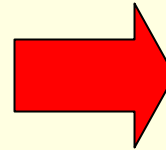
We've adopted the full range of "usual" strategies



The location of check operations is moving from bank backrooms to customer backrooms



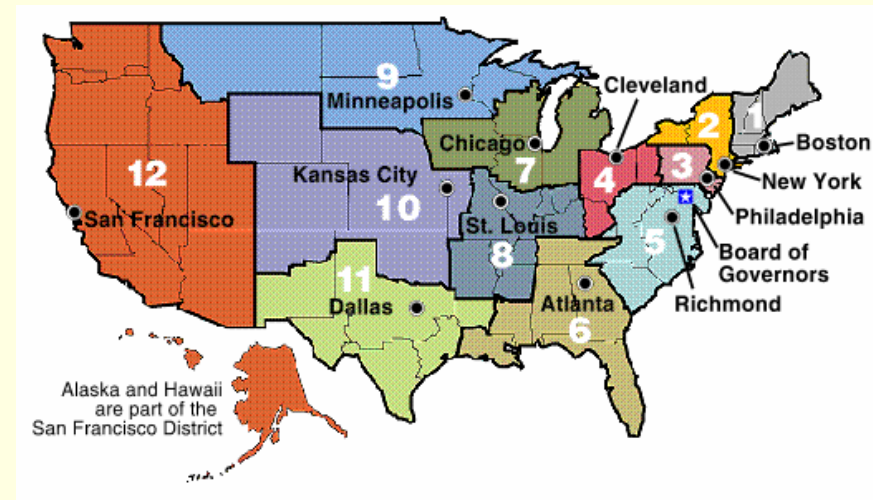
Sorter manufacturers/distributors moving from high speed to remote capture devices



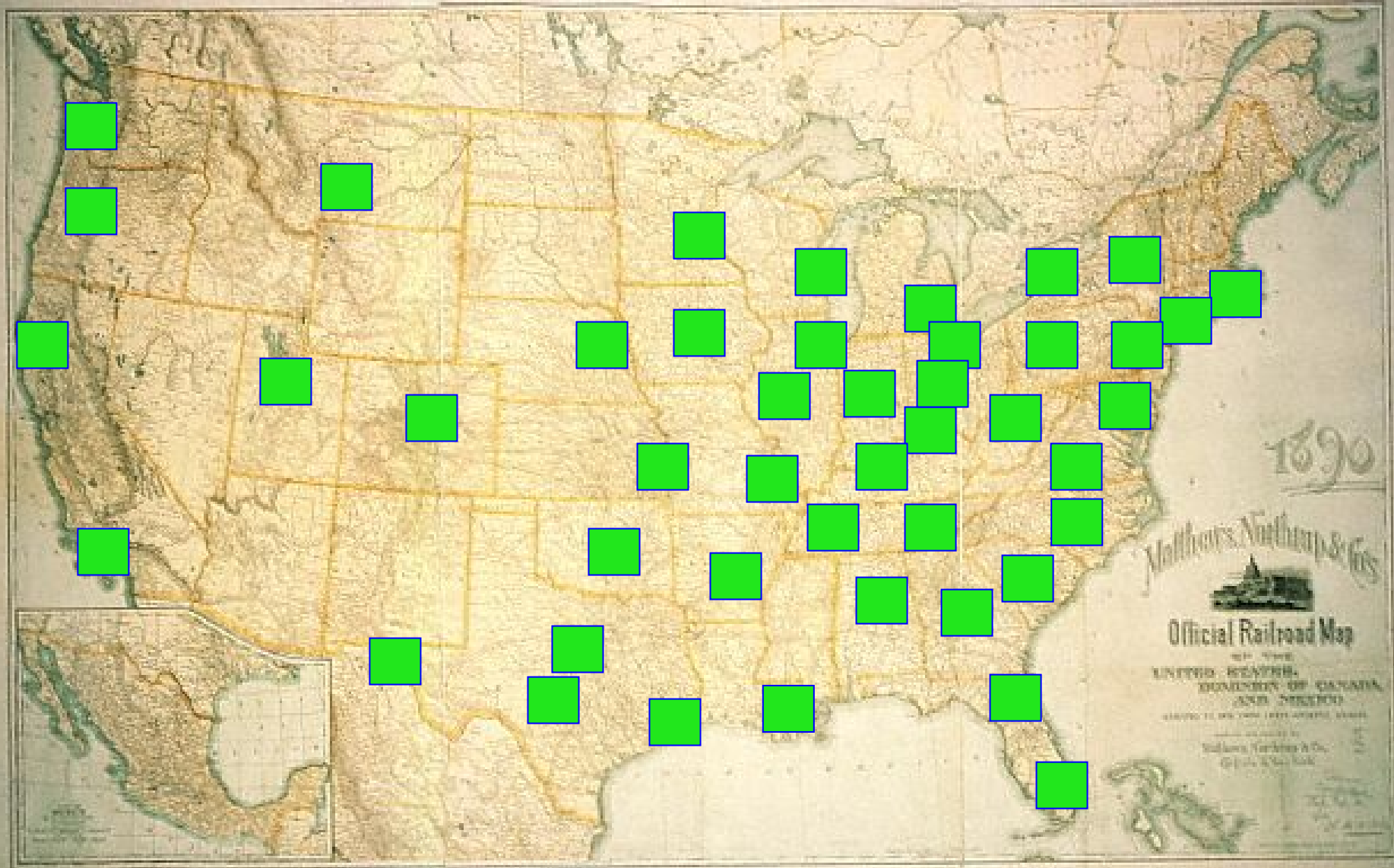
Expedited air couriers diversifying their transport business



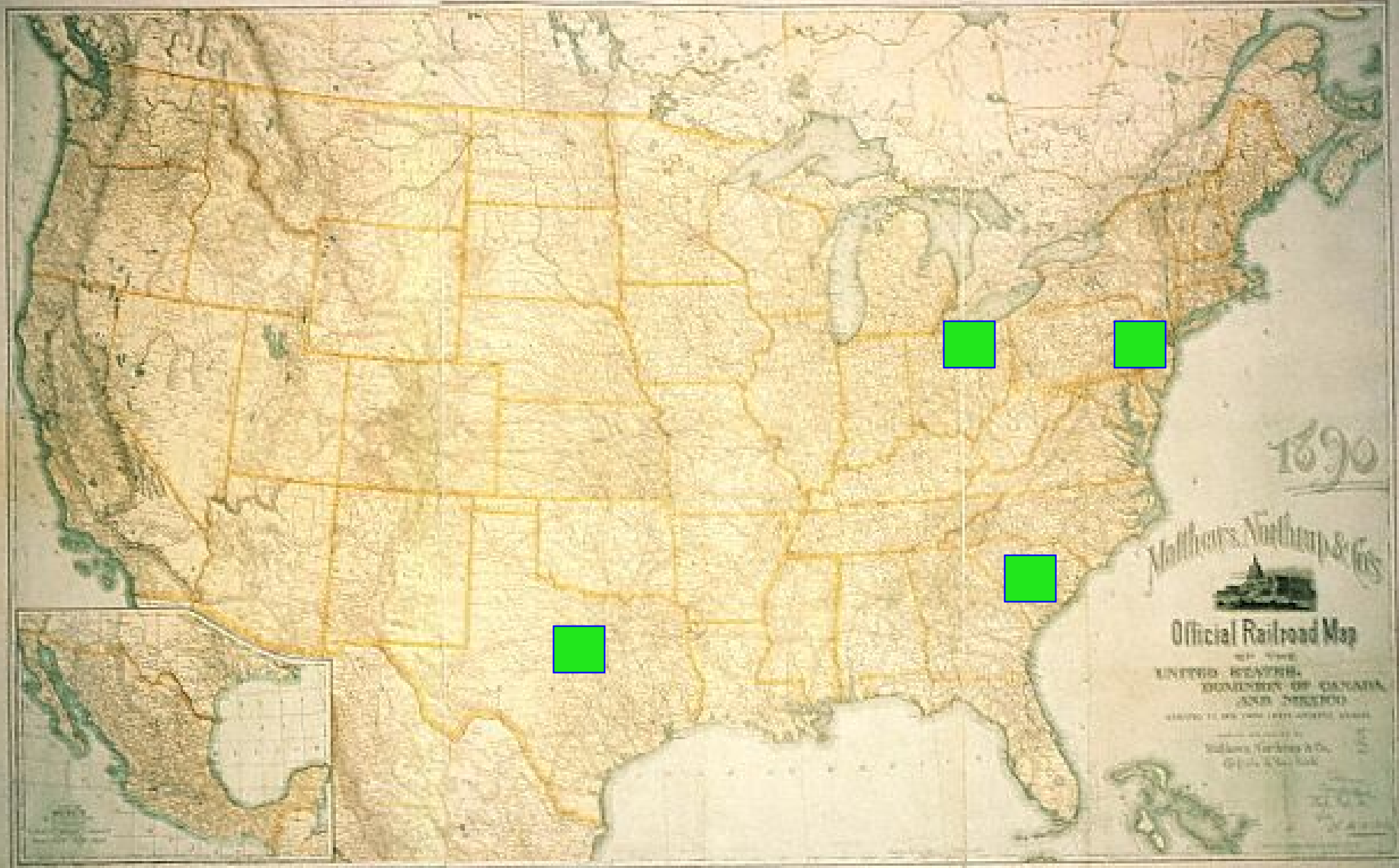
The Federal Reserve is as much a participant in this change as an observer



The Fed's check processing infrastructure in 2003



The Fed's check processing infrastructure in 2010 - 11

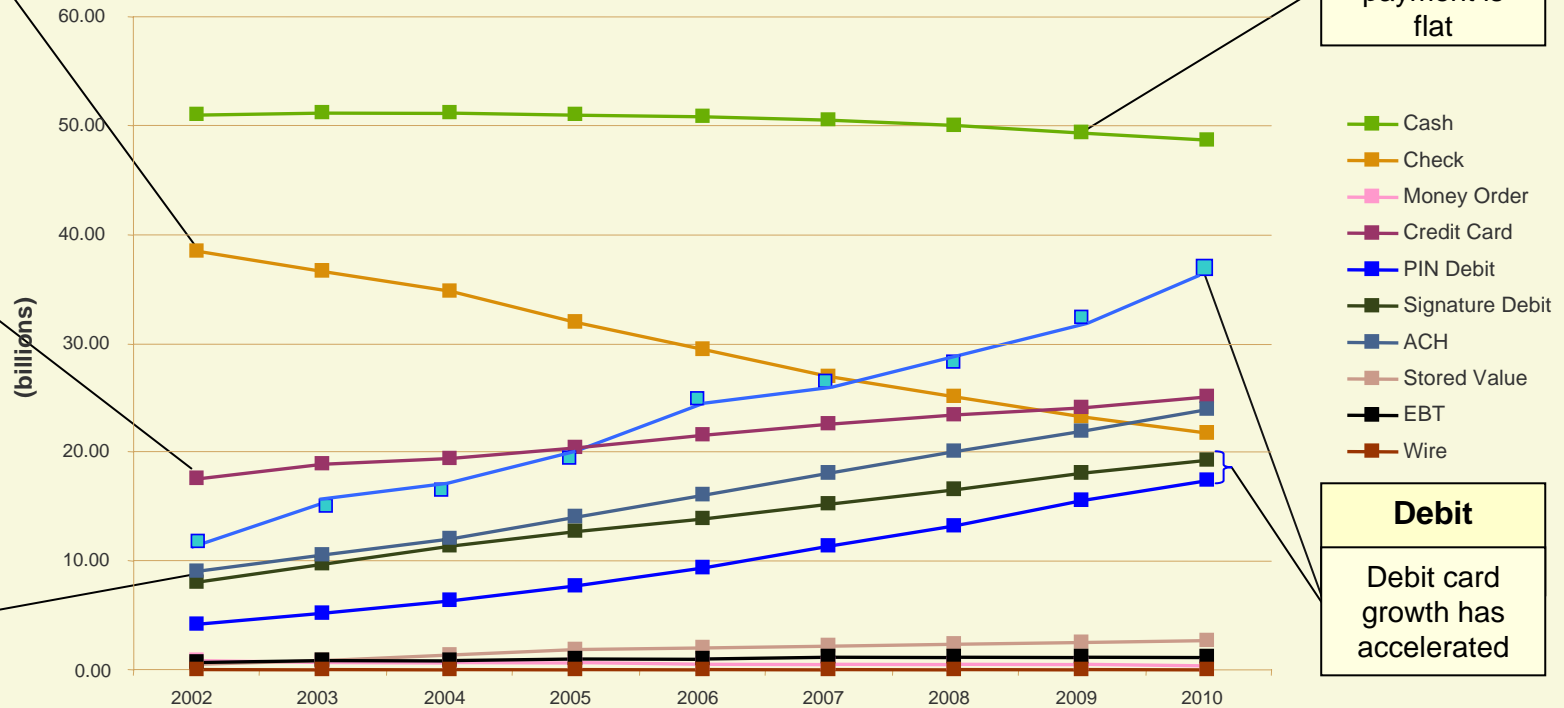


The Fed continues to adjust our check transportation infrastructure



The Big Picture of Payments

Estimated Total Number of Transactions by Payment Instrument



Check

Check volumes declining

Credit

Credit Cards are growing, but at a slower rate

ACH

ACH continues to grow steadily

Cash

Cash payment is flat

Debit

Debit card growth has accelerated

SOURCE: The Nilson Report, ATM & Debit News

e-commerce - who's online and why

Consumers Are Connected

- In the U.S., 69% or 207 million use the internet
- 71% of U.S. adult Internet users buy products online vs. 65% in 2005

Some Like Speed

- 47% of U.S. adult Internet users have broadband access at home, up from 42% in 2006

Some Are Really Connected

- 34% of Internet users have wireless mobile devices and use them to access the Internet
- 80% of these users have broadband connections at home

Consumers' Internet Use

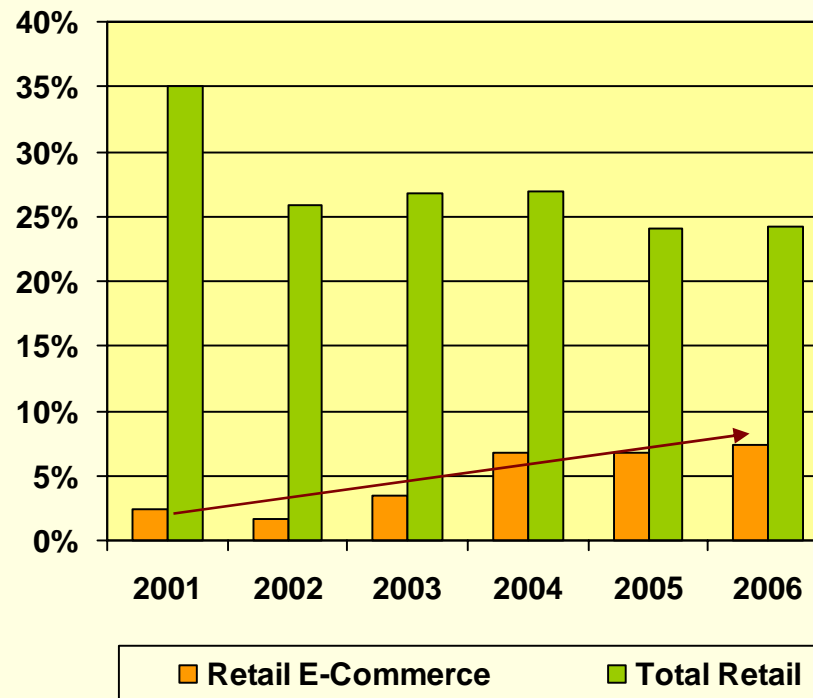
Top Ten List



Sources: International Telecommunications Union, Nielson/NetRatings, Pew 2006 & 2007, Economist Intelligence Unit 2006

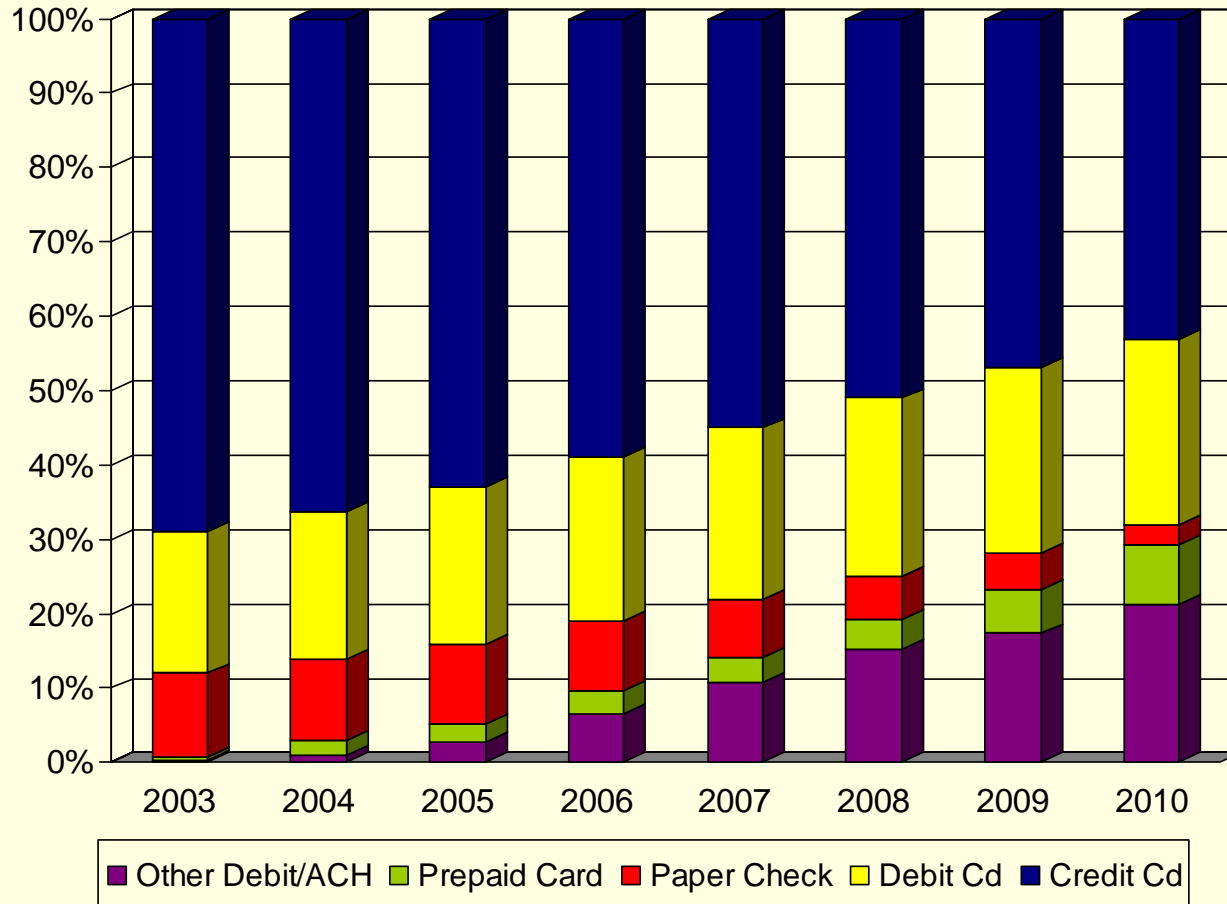
e-commerce : on-line versus in-store

US Retail Sales Growth
January - June Sales 2001 - 2006
(Excludes Travel)



Sources: Pew Research 2006, U.S. Census Bureau February 2007

e-commerce - how are they paying ?



Government as catalyst to change

- Space program helped give us: Kidney dialysis machines, CAT scanner, new water purification technology, Velcro, cordless appliances, smoke detectors, new insulation and plastic materials, Tang and Space Food Sticks.

Let's talk about a big player in payments - U.S. Treasury



- Treasury (the 800 lb gorilla in payments)
 - disburse about 1 billion payments, to 100 million people worth \$1.5 trillion per year
 - collects about \$2.7 trillion per year

Treasury/Government as catalyst

- Past
 - ACH
 - Check imaging and archiving
 - Electronic Benefits Transfer (EBT)
- Present/Future

B2B/IPP

- Internet Payment Platform (IPP) - a G2B solution for Federal Agencies managed by FRB Bahstun (Boston)
 - Production year-end 2007
 - Electronifies and links - purchase orders, invoice receipt, payment authorization and payment between Agencies and their vendors
 - Many direct benefits and facilitates move from checks to electronic payments
 - Available to all Federal Agencies and their suppliers

Stored Value Card

- Smart card based stored value card for US military managed by FRB Bahstun.
- Training bases, overseas Army and AirForce peacekeeping bases, Navy ships (Chase)
- Peacekeeping and Navy cards are reloadable.
- Peacekeeping bases include self-service kiosk to load funds from domestic bank accounts via ACH
- Over one billion dollars loaded to-date for all three programs

Pay.gov

- Web system: hosts payment forms for government agencies, collects payment data, and processes payments via ACH or credit card.
- Early adopter - WEB ACH payments and Knowledge Based Authentication
- 102 agencies (317 lines of business) - 170 payments forms and 20 bills
- 4.9 million transactions, \$17.7 billion during the first 6 months of 2007
- Managed by FRB Cleveland

Point of sale check conversion (PCC)

Converts checks to ACH or Check 21 items at federal agencies or military locations..

- Early adopter of
 - Remote Capture
 - Electronic Check Conversion
 - Check 21
 - Back Office Conversion
- 32 agencies at 630 worldwide locations
- 1.4 million transactions - \$3.6 billion during the first 6 months of 2007
- Managed by FRB Cleveland

Treasury debit card use



- Department of Agriculture
- Department of Commerce, U.S. Census Bureau
- Department of Defense, U.S. Southern Command
- Department of Energy, Bonneville Power
- Department of Health & Human Services, National Institute of Health
- Department of Homeland Security
 - Citizenship and Immigration Services
 - Immigration and Customs Enforcement
 - Transportation Security Administration
- Department of Interior, Office of International Affairs
- Department of Justice, U.S. Marshals Service
- Federal Trade Commission
- International Boundary and Water Commission
- Peace Corps
- Holocaust Museum

Treasury *Direct Express* Card: Debit Card for Benefit Recipients

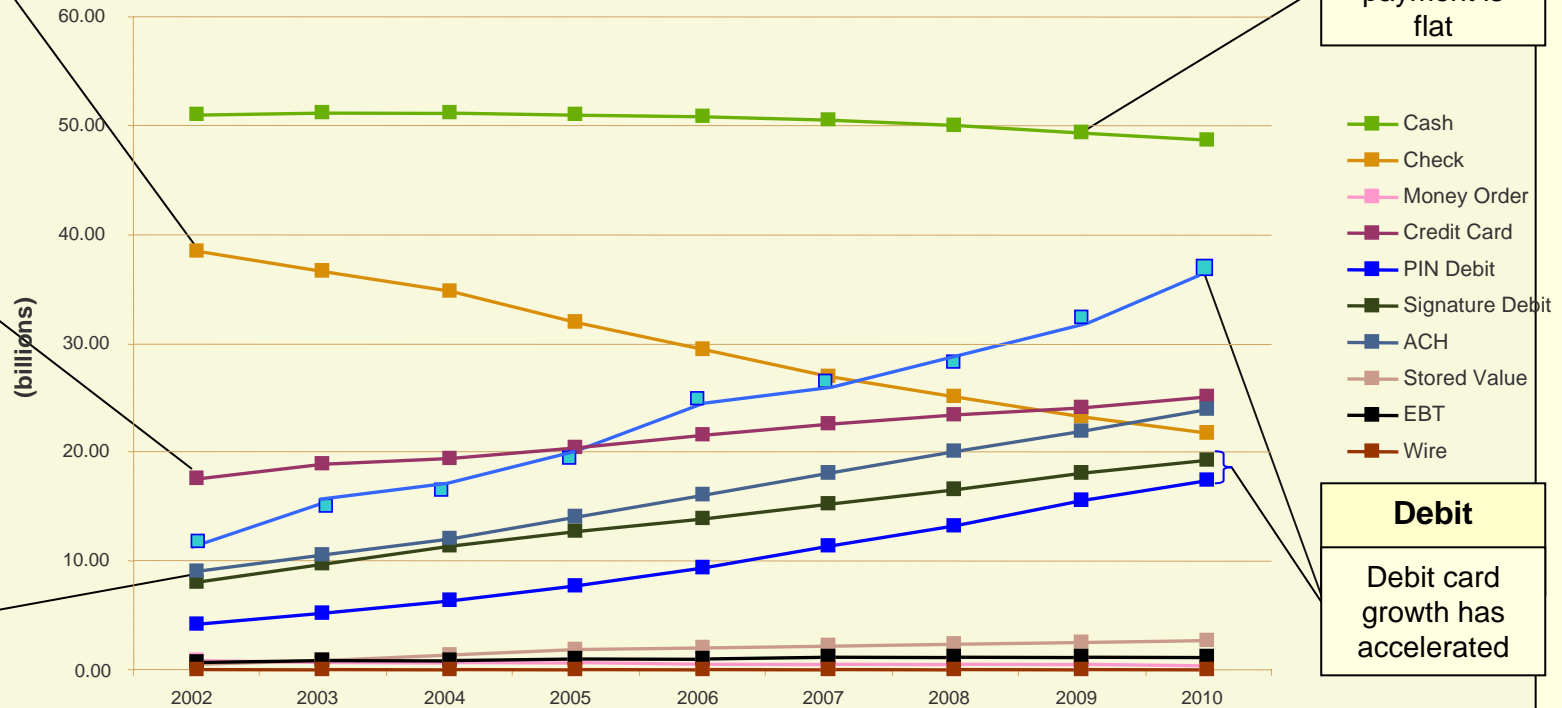
- EFT solution for the unbanked
- Piloting for one year
- Currently 1,000 SSA and SSI recipients enrolled
- Similar to payroll cards, no/low fees for limited use options
- FDIC insured, interest bearing
- PIN or signature based stripe card

What the future holds



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In Closing

Thank you !

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