Measuring
To Make a Difference

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Federal Reserve Board

Wealth Inequality: Theory and Empirical Data

Oesterreichische Nationalbank

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Opinions expressed are my own and they do not necessarily reflect the views of the Board of Governors of the Federal Reserve System or its staff.

Thanks!

- **Everything I know I learned from others**

- FRB colleagues: Jesse Bricker, Brian Bucks, Gerhard Fries, Traci Mach and Kevin Moore
- NORC colleagues: Cathy Haggerty, Micah Sjoblom, the field management and support team and the **interviewers**
- Many other colleagues

- SCF **Respondents**

Outline

- History

- Stay out of the "Emergency Room"

- A Communication Engine

- Measurement to support progress

- Changes in U.S. household wealth over the financial crisis

- Conclusion

Relevance in Measurement

- Virtually all interesting measurement is an approximation
- Stability of underlying process
  - Basic physical processes appear to be stable, demographic processes tend to move slowly
  - Economic processes tend to mutate in response to incentives (and sometimes measurement)
  - Correlations at macro level can change as a result of heterogeneity or changes at the micro level

- **Evaluation and adaptation in measurement**
- **Continuing feedback from analysis to measurement**
- **Both critical for maintaining relevance**

A Very Short History of Surveys

^ Interviewer-mediated

- Neyman 1934

- Sudman and Bradburn 1974

- Role of women in the "Golden Age"
  - Subsequent changes in labor markets

- Paper questionnaires → CAPI

- Rising cynicism/demands on time

Theory

- Three critical elements
    - Design and selection of its sample
    - Design and implementation of content
    - Execution of the survey
- In theory, the result is a realization of a Monte Carlo process
    - All inherent variability defined only by the sample

Reality

- Collision of theory with complex realities
  - Not an engineering problem: human behavior
- Interviewers and respondents face complicated incentives that may affect their behaviors
- Limited time/attention
- Knowledge or knowability
  - Also, conceptual variability
- Trust
- Distribution of meaning
  - Inherent ambiguity in language

Survey of Consumer Finances

- Important and unique data
- Sensitive topic
- Long interview
- Technical topic
- Financial literacy issues
- Many hard-to-reach respondents
  - Designed to obtain large number of wealthy families
- Heavy demands on interviewers
- Nonresponse
- Data quality problems
- **IMPOSSIBLE!**

The Emergency Room

- **Aside from the most basic forms of data processing to assemble an analytical data set and the efforts applied to limit the possibility of re-identifying respondents, all else we do in processing a survey is a necessity imposed by failure—in the questionnaire, in the sample, in the preparation for potential problems faced in field work or the support of field work.**

- No excuse for questionnaire or sample failures.

- Field work is uncertain, but indirectly controllable

Survey Surgery

- Attracts disproportionate intellectual attention
- Adjustments for unit nonresponse
  - Response bias studies
- Imputation for missing data
- Editing
  - Detailed review of data and supporting comments
    - Huge effort by highly skilled people

Editing Uncovers Big Problems

% difference in net worth at quantiles of the distribution, before and after editing
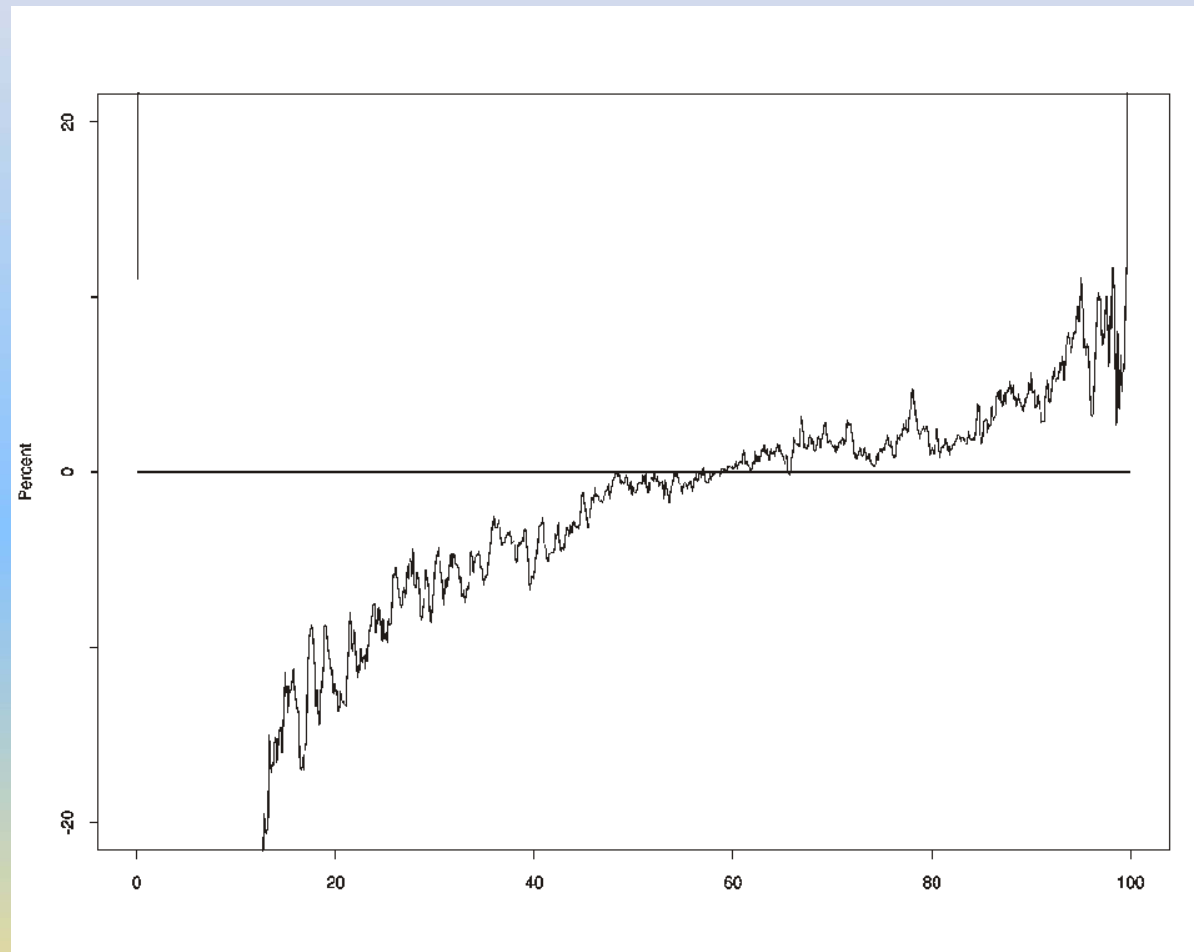
What Edit Review Shows

- Most often, editing review reveals
  - Respondent did not understand
  - The interviewer did not understand
  - The interviewer did not follow instructions
  - Question wording is ambiguous
  - Underlying concept has shifted
  - Situation too confusing to cope with effectively
- Communication failure!
  - (But still an important opportunity to learn –will return to this)

Go to the Source and Fix it!

- **Arnold Zellner:** Solve the underlying problems!
- Pay attention to indications of error and track to their source.
  - Errors are opportunities
  - In complex systems, such as field operations, learning by doing is critical
- Some problems out of direct control of the survey designers, but amenable to indirect controls to minimize problems
- Changing a complex system requires commitment

Continuous Improvement

- William Blake: "If others had not been foolish, we should be so."
  - We can be the "others" over time
- Requires that we structure error handling to provide information from which to learn.
  - Some mechanical/analytical
    - Programmatic detection, process logs
    - CAPI checks
  - Most important parts are more human, esp. getting beyond blame
    - **Encourage honesty, face fear → Trust**
- Act in the present, with an eye on the long term
  - Can't always do what is needed now
  - Incomplete information
- Stop, look, listen (and listen some more, and be sure it is "active listening")—waste nothing!

A Communication Engine

- Surveys are elaborately mediated conversations between analysts and respondents
- Can be like successively translated jokes
- Conversations and engagement lead to a more common understanding, if everyone has a common focus
- Find means to engage all players in a common task to support data quality
  - Ability to include respondents, but more limited
    - The interviewer is the critical agent there

Learning to Listen

- Relationship of asymmetric information
  - Analysts, central operations, field supervision, interviewers

- Analysts "know" what they want
- Only interviewers see what really happens
  - Respondents may drift from desired focus, lack motivation
- People in between have to create their own picture(s) to reconcile the two, or to direct operational process

- Create systems to reduce the asymmetry of information
  - Use interviewers to reduce variability of understanding by respondents

The Hardest Job: Interviewer

- Most essential gatekeeper for data quality
- Working alone
  - Support systems essential
- Multiple skills, possibly on "different chromosomes"
  - Gaining/maintaining cooperation
  - Technical task of interviewing
  - Administrative tasks
  - SCF addition: communicating about experience
- The moment of execution depends on the interviewer
  - Need deep trust in their fidelity to the task
- Isn't it obvious that everything should be built to support the interviewer?!

A Deeper Conversation, 2013

- "Kicking and screaming on both sides"
  - "Are we/they exceeding our/their competence?"
- Move part of editing operation to the center
  - Enables understanding of quality problems invisible in higher levels of abstraction
  - Closer to the point where knowledge can be communicated "in the same language"
- Capture and analysis of patterns of error
- A goal is progressively to eliminate or radically reshape editing, in large part by addressing communication failures and the way we view communication

Measurement to Support Progress

- Make things measurable to provide a basis for improvement
  - Otherwise, quality improvement exercise can become an empty exercise in box checking
  - Need to act before paradata systems are perfect
    - Sometimes necessary to act to get data to go further or even to figure out what to measure
- Call records
- Response bias studies
- Missing data rates by variable
- Edit frequencies
- Interviewer comments/debriefing → codified information
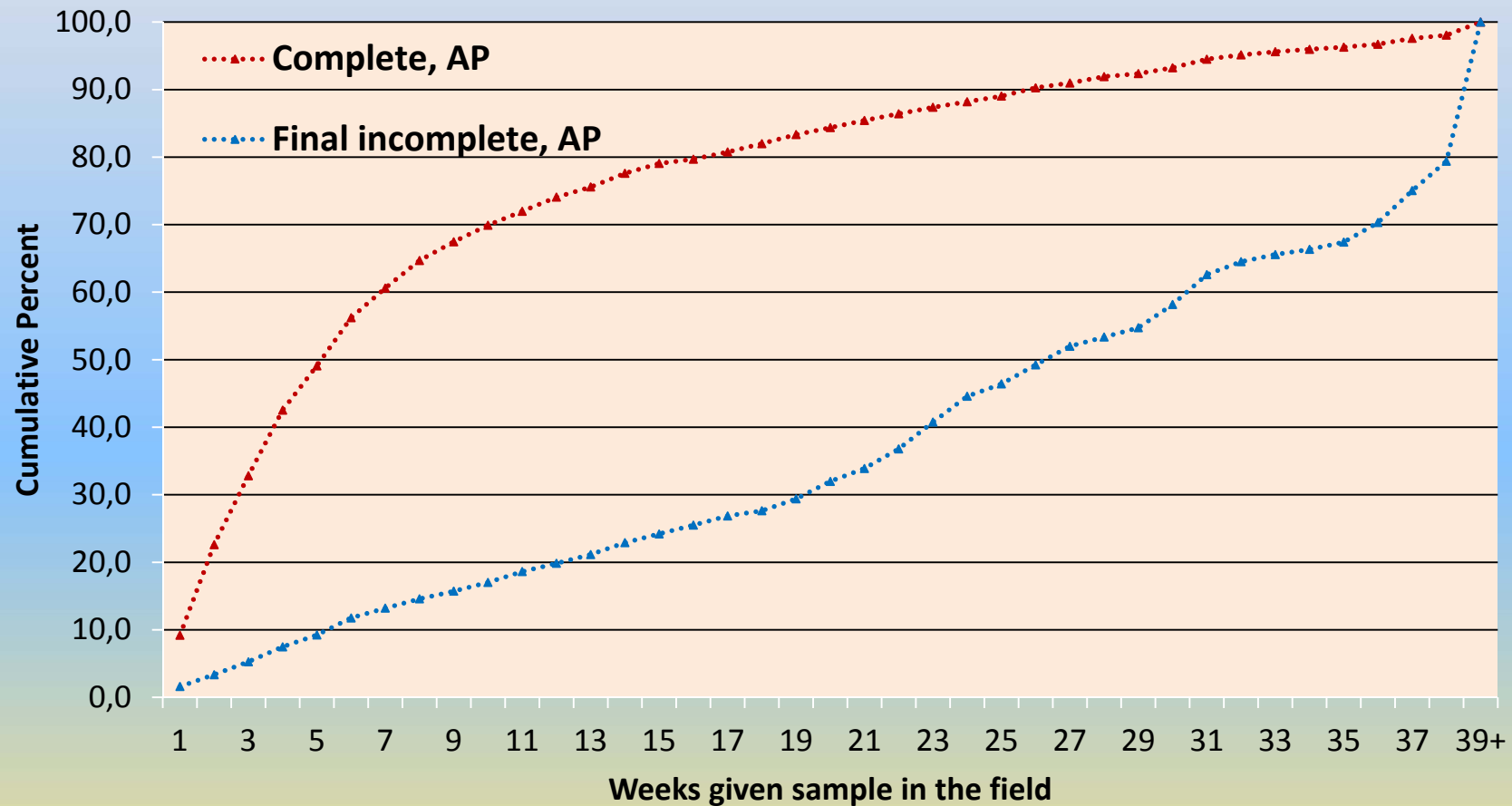
Cumulative Distribution
Weeks to First Personal Contact

Cumulative Percent

····▲···· Complete, AP

····▲···· Final incomplete, AP

Weeks given sample in the field
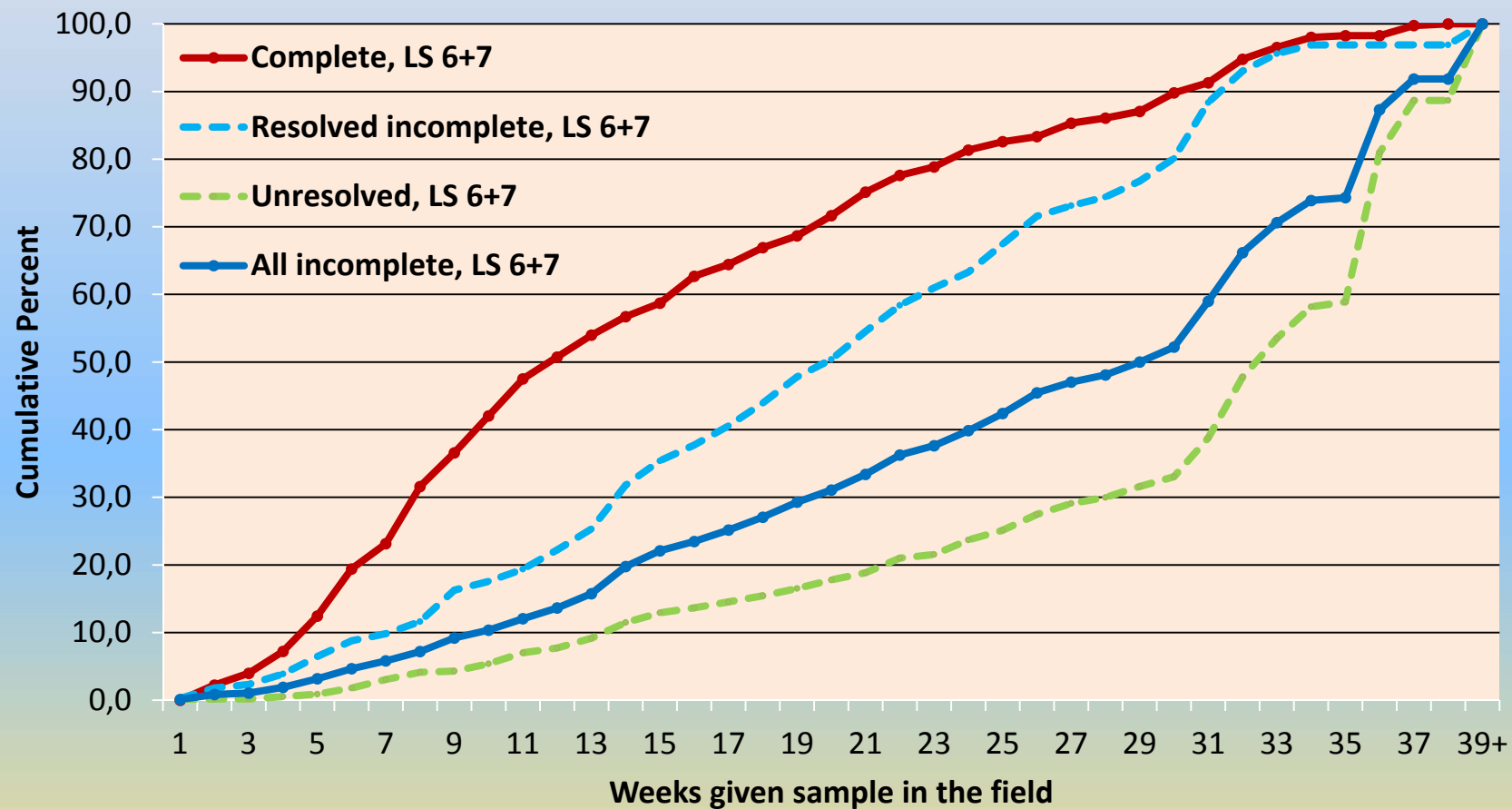
Cumulative Distribution
Weeks to First Personal Contact
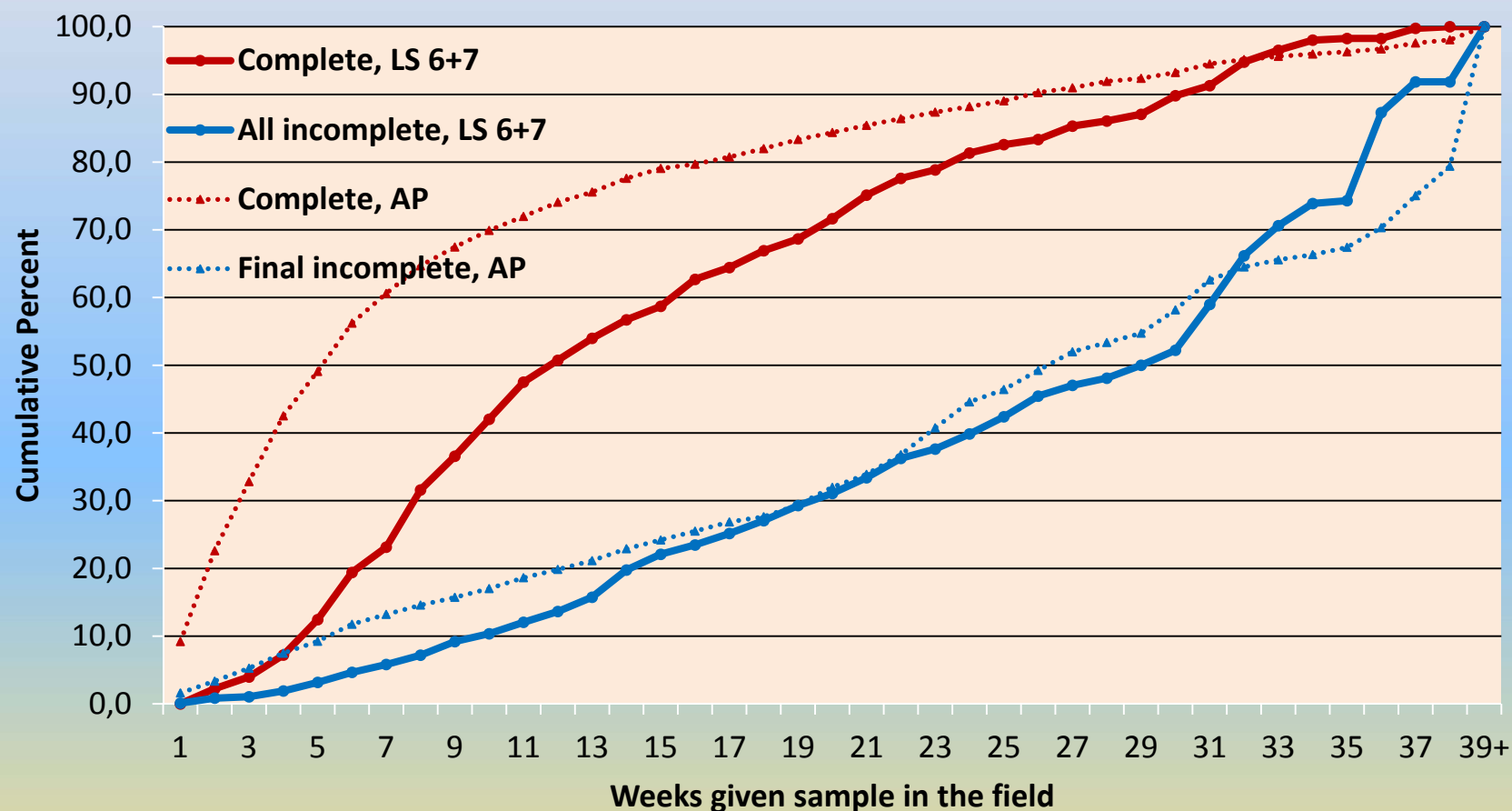
Organization of Effort

- Suggested taking action to improve success of initial contact attempt
    - Wealthier cases appear harder to reach, but only for the completes
- More detailed examination suggested excess variability of effort with hard-to-see benefits
- *Analytical limitation*: Effort drives call records, and motive for effort unobserved
    - Still need more progress in defining standards here
    - (Also realized needed better approach to making call records!)

- Developed a more formal contacting strategy

SCF Contacting Strategy
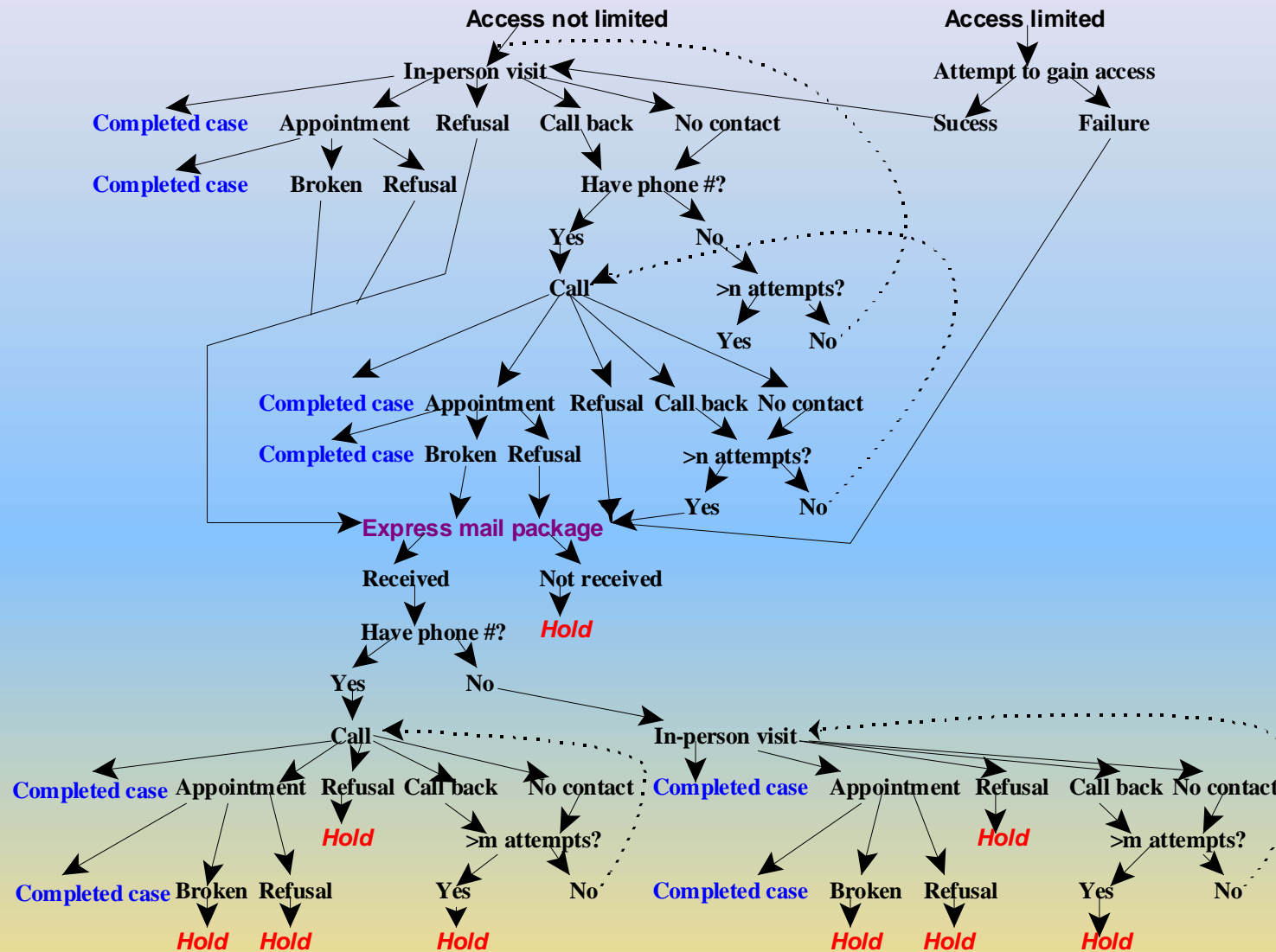
Result of Contacting Strategy

- More comparable measures of applied effort
  - Better support for nonresponse bias analysis
    - So we can better target persuasion efforts, not just to make our "plastic surgery" better!

- Provides assurance that everyone has a meaningful chance to hear the message
- Structure provides guidance for interviewers and gives clearer standards for evaluating efficiency

- Initially resisted, but now part of the routine

Binding Together for Common Goal
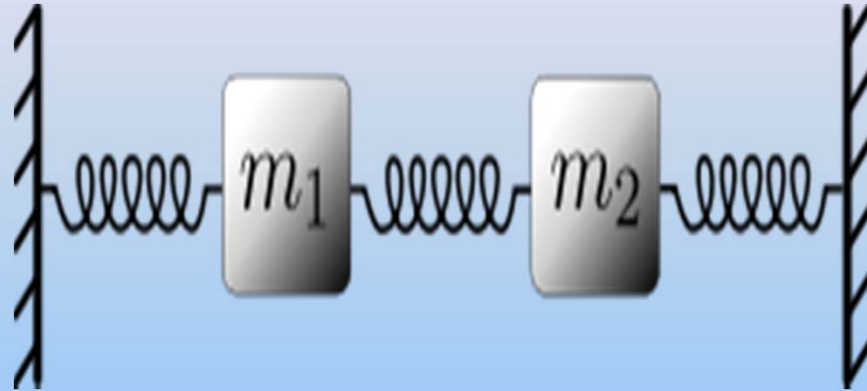
- Preparation
- Execution and control
- Post mortem
- Continually planning for the future

- Training is a moment when all paths converge and we attempt to share common wisdom

"Pentecost"

Wealth Change and the Financial Crisis

- Background
- Description of the data
  - 2007-2009 Survey of Consumer Finances panel
- Distributional shifts in U.S. wealth over the financial crisis
  - Related changes
  - Heterogeneity matters for understanding aggregate outcomes
- Some conclusions

U.S. Household Sector Net Worth

2009 dollars (trillions)

Shaded area represents range of 2007 and 2009 surveys (2007-Q3 to 2009-Q3)
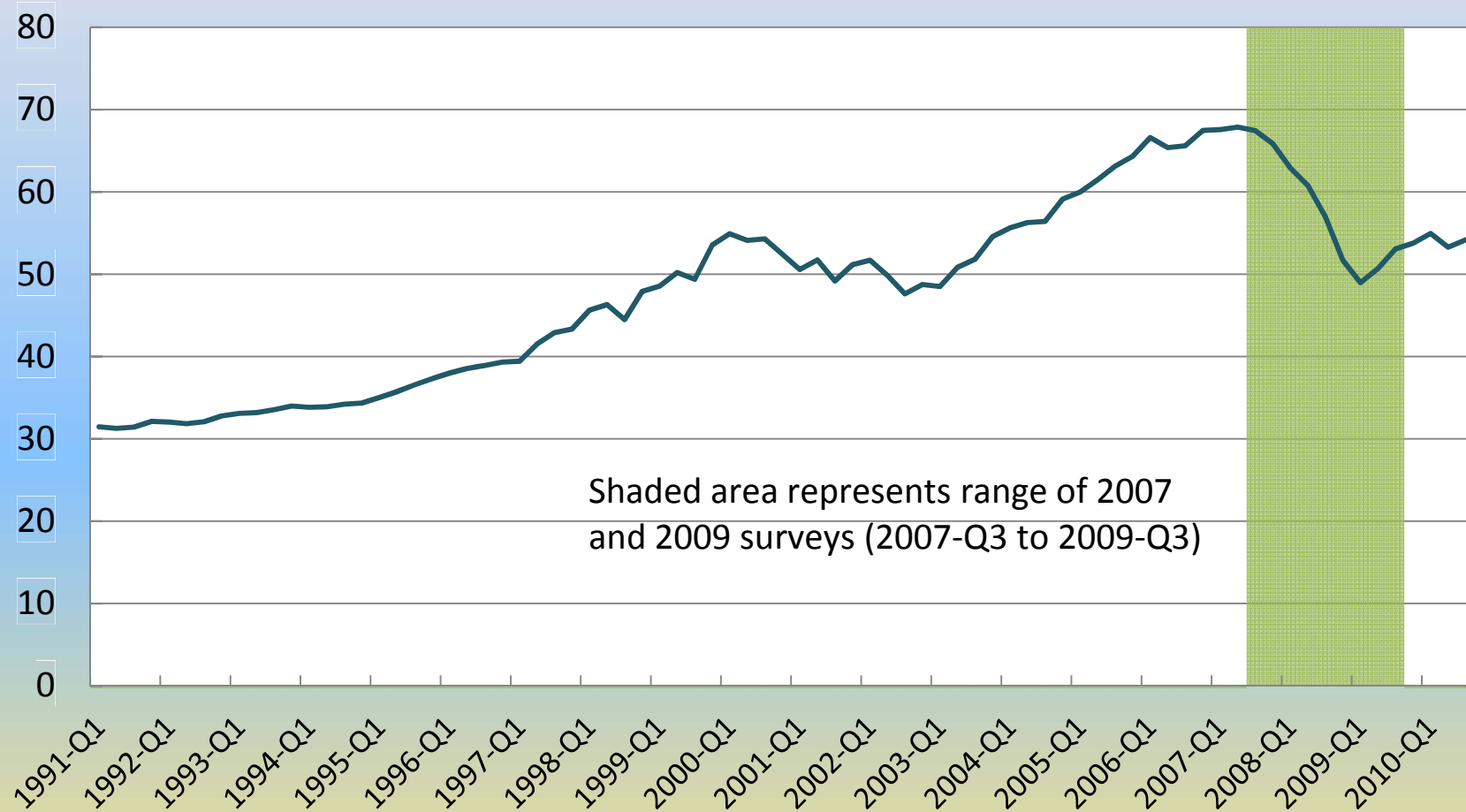
Source: U.S. Flow-of-Funds Accounts

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Consumer Spending Around Recessionary Troughs
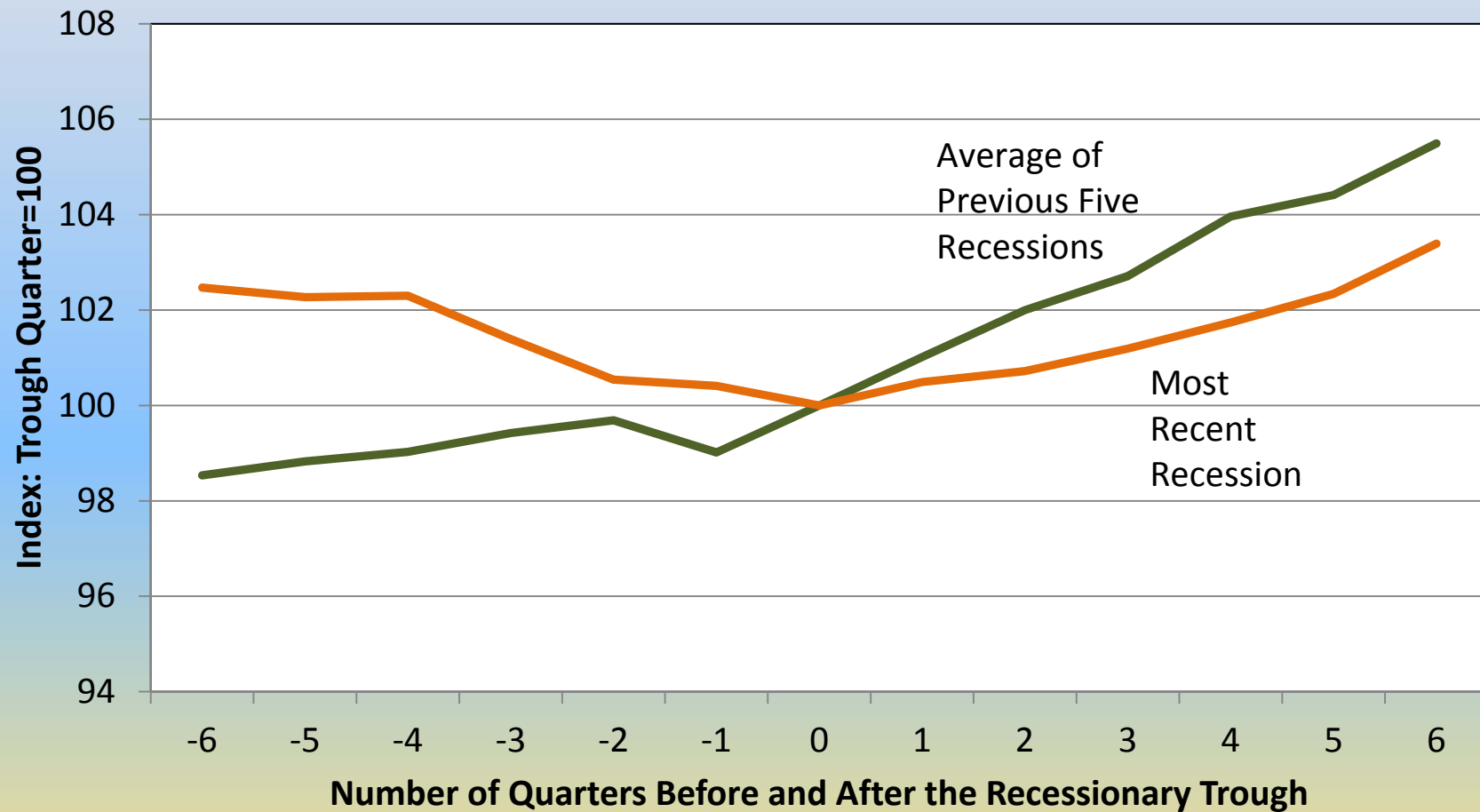
Wealth Change

- FFA household sector net worth fell by about 28% over the period 2007-2009
- Sluggish recovery of consumption

- Direct wealth effect?
- Shift in relationships among economic variables, esp. income?
- Effects on risk tolerance?
- Behavioral changes?
- Other important heterogeneity?

Background on the SCF

- Survey of finances of U.S. households
- Triennial cross section
  - Last completed in 2010
- April 2009, FRB gave support for a panel interview with 2007 participants
- In the field July 2009 to bit into January 2010

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2007-2009 Panel Sample

- Baseline 2007 sample
  - Broadly representative area-probability sample
  - List sample that oversamples the wealthy
    - Excluded people named in the *Forbes* list of 400 wealthiest
- Panel sample: 2009 household of the 2007 respondent
  - If dead or permanently out of the country, that person's 2007 spouse or partner
  - At most, one 2009 household interviewed

Panel Content

- Cross-sectional SCF interview typically requires 75-90 minutes
  - May take up to 4 hours for person with complex finances
- Necessary to reduce length and variation in length for the panel
- Panel questionnaire built around framing of the cross-sectional version
  - Maximized comparability subject to length constraint
  - Far less detail collected

Representativeness of the Panel

- Nonresponse
  - Nearly everyone was located and re-contacted
  - 89% of eligible cases re-interviewed
  - Negligible difference in participation of very wealthy households and others
  - Any biases from original sample of necessity follow through

- Changes in household composition
- Panel aging
- Represents a version of households that existed in 2007

- Nonsampling error
  - Longitudinal editing and imputation help to mitigate problem

Changes in Household Composition, 2007-2009
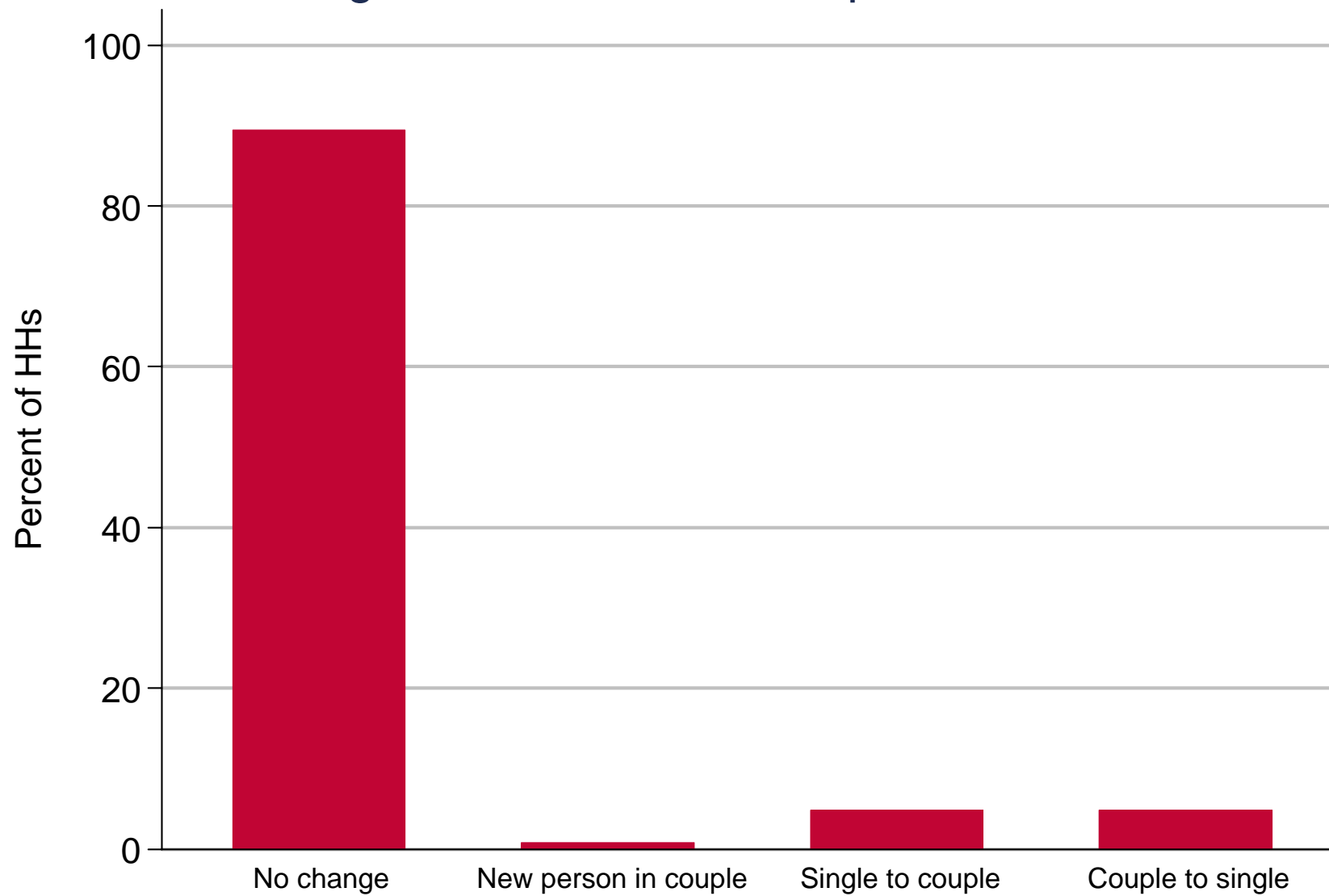
Overall Picture

- Strong downward shift in the wealth distribution is also clear in the micro data

Overall Distributional Shift

Percent change in:
Mean: –19.3%
Median: –23.4%
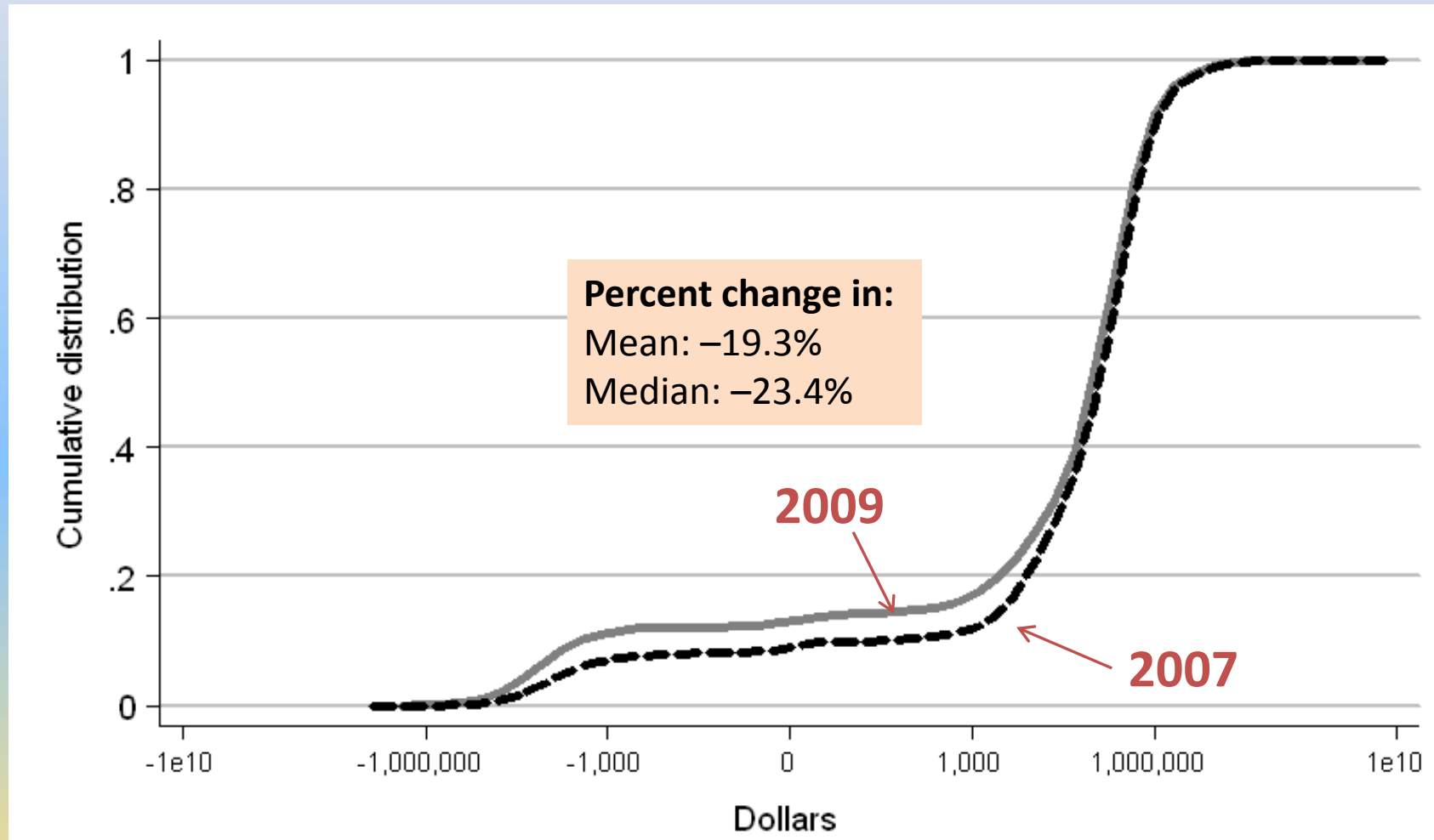
2009

2007

Overall Change in Net Worth

- Flow-of funds measure of household sector net worth declined about 28%

SCF measure

		2007 (th. '09 $)	2009 (th. '09 $)	% change
Net worth				
	Mean	595.4	480.5	-19.3
	Median	125.4	96.0	-23.4
Memo: **Income**				
	Mean	87.3	76.5	-12.4
	Median	50.1	49.8	-0.6

Quantile-Difference: Levels: 2009-2007
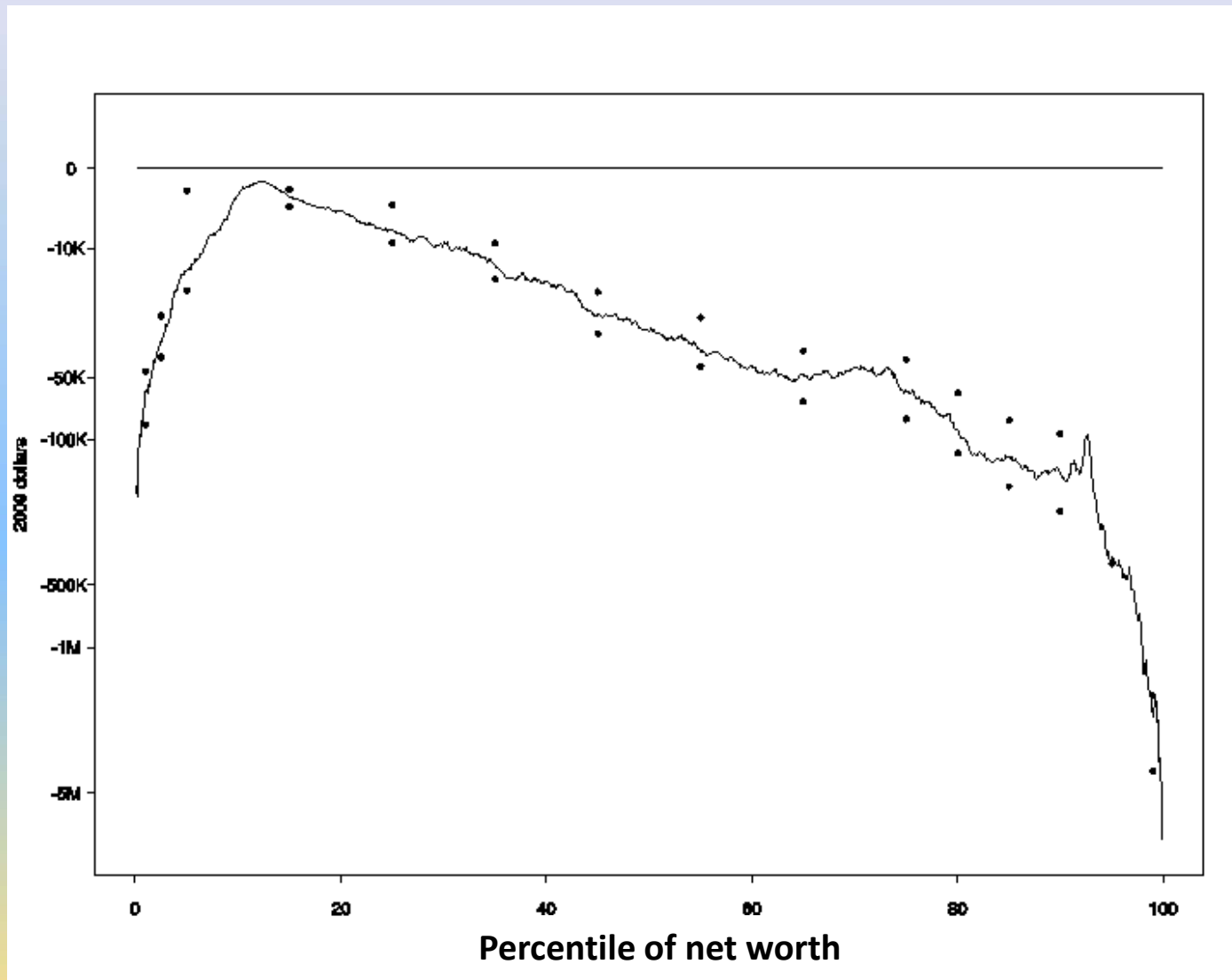
Quantile-Difference: Percent: 2009-2007
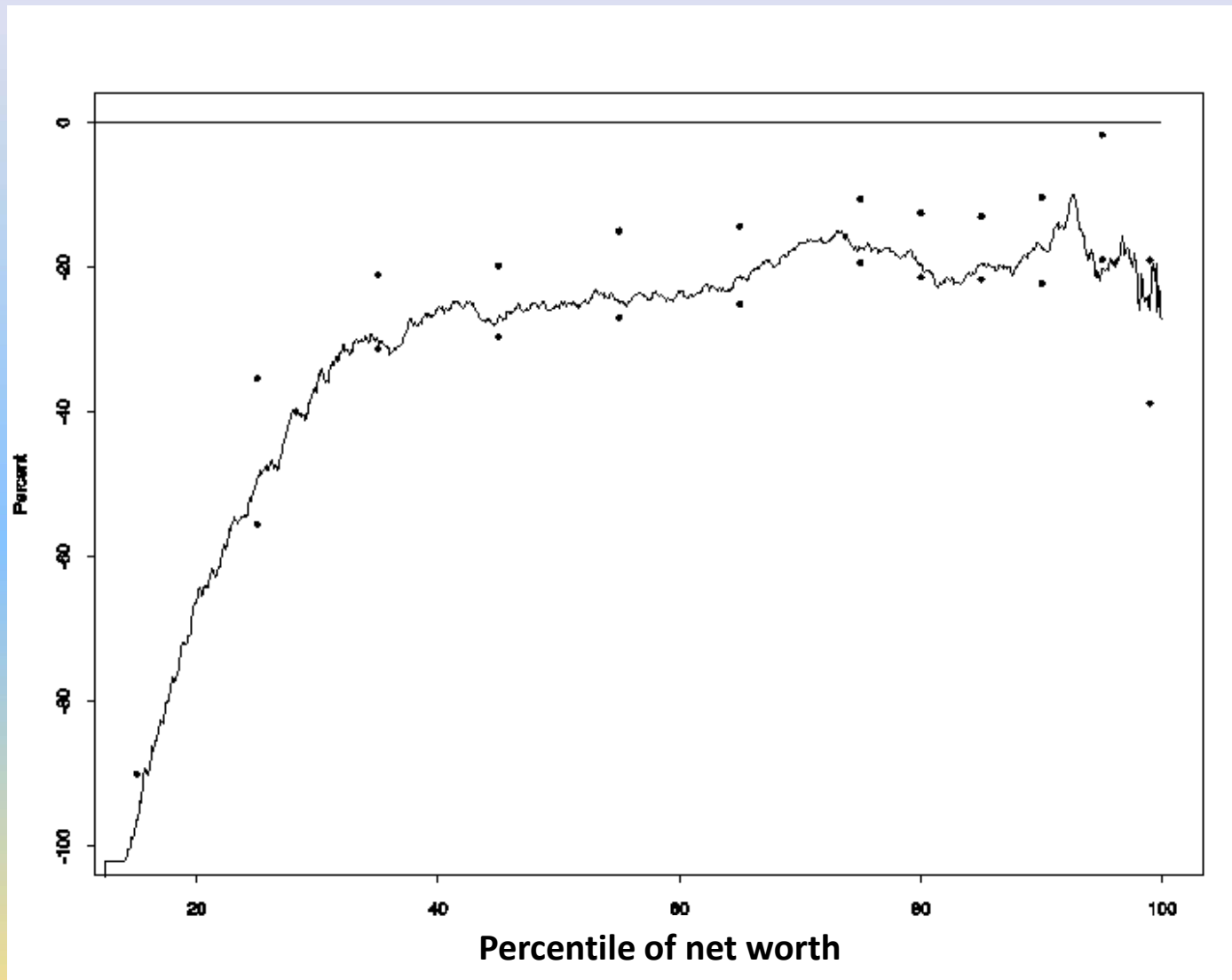
Net Worth by Percentile Points

Percentile	2007 value (th. 2009 $)	2009 value (th. 2009 $)	Percent change
25	15.5	8.2	-47.1
50	125.4	96	-23.4
75	388.6	330	-15.1
90	970.3	823.7	-15.1
99	9015.8	6917	-23.3

Fraction with negative net worth rose from 8.2% to 12.3%

Wealth Shares

- Overall, distribution of wealth did not move much in terms of shares of the (smaller) total

- But, again, much movement among groups

- Almost half of losses in net worth concentrated in the wealthiest 1%

Concentration of wealth, 2007 & 2009
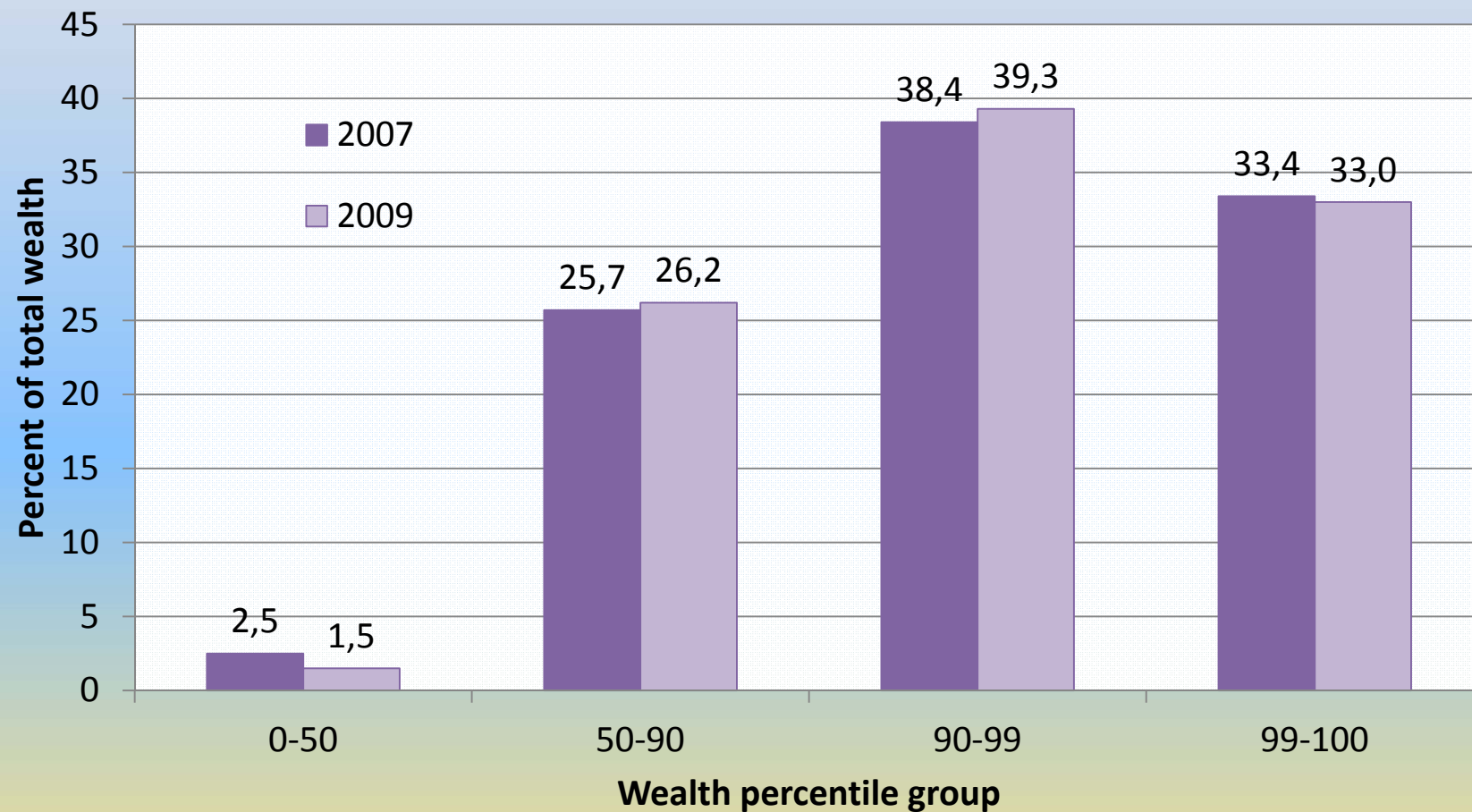
Household-Level Change

Sometimes everything must change so that everything can remain exactly the same.

Losses: 62.5% in group
Median -41.5% 2007 NW

Gains: 38.6 % in group
Median +32.8% 2007 NW

No change:
0.7% in group

Density

-1e10   -1,000,000   -1,000   0   1,000   1,000,000   1e10

2009 dollars
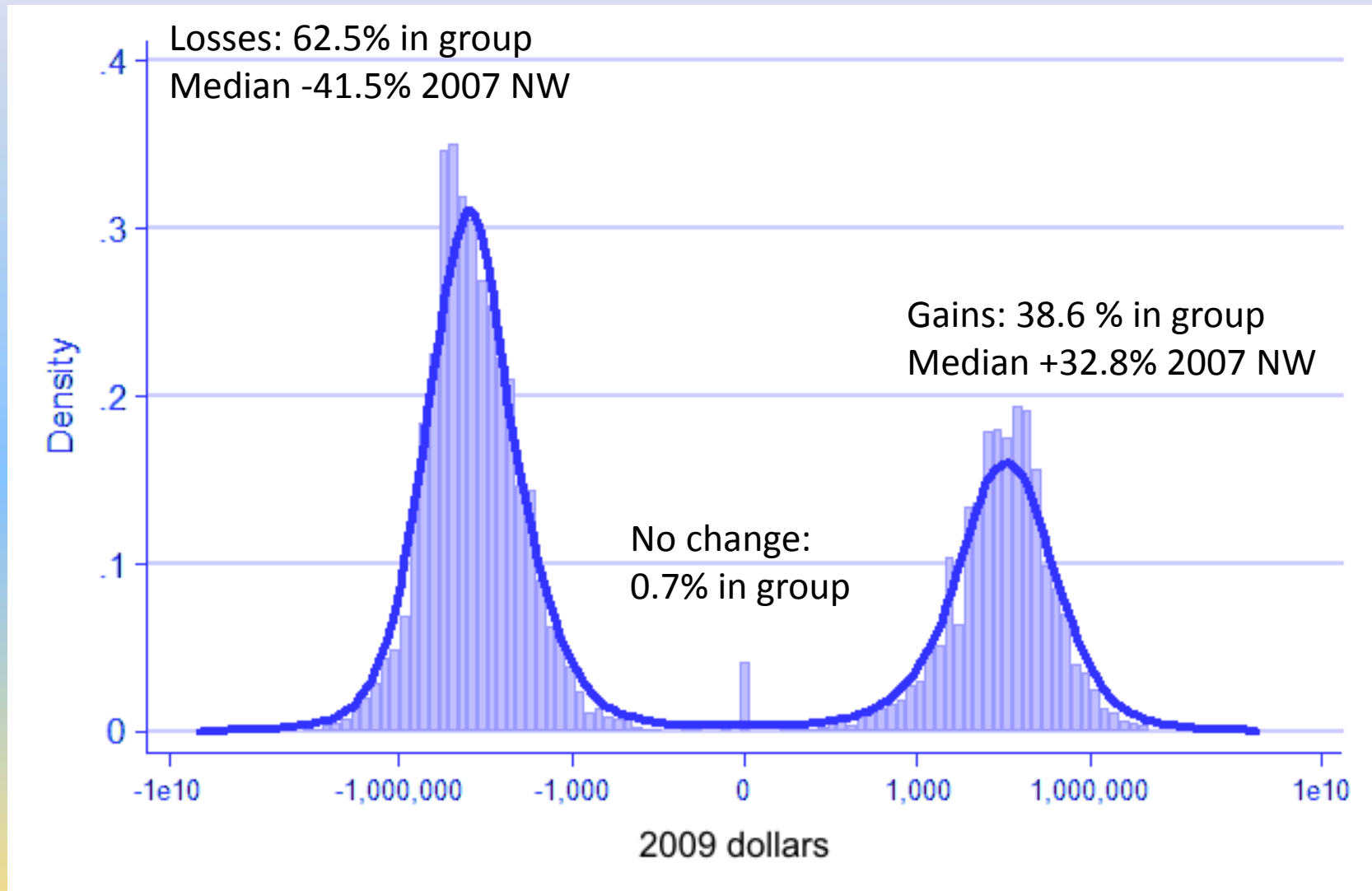
Gains and Losses in NW, 2007-2009

Overall		
	Median % 2007 NW	-20.8%
	Median amount	$-11,400
Losses		
	Percent having	62.5%
	Median % 2007 NW	-41.7%
	Median amount	$-60,400
Gains		
	Percent having	36.8%
	Median % 2007 NW	32.8%
	Median amount	$32,800
No change		
	Percent having	0.7

Concentration by 2007 Groups
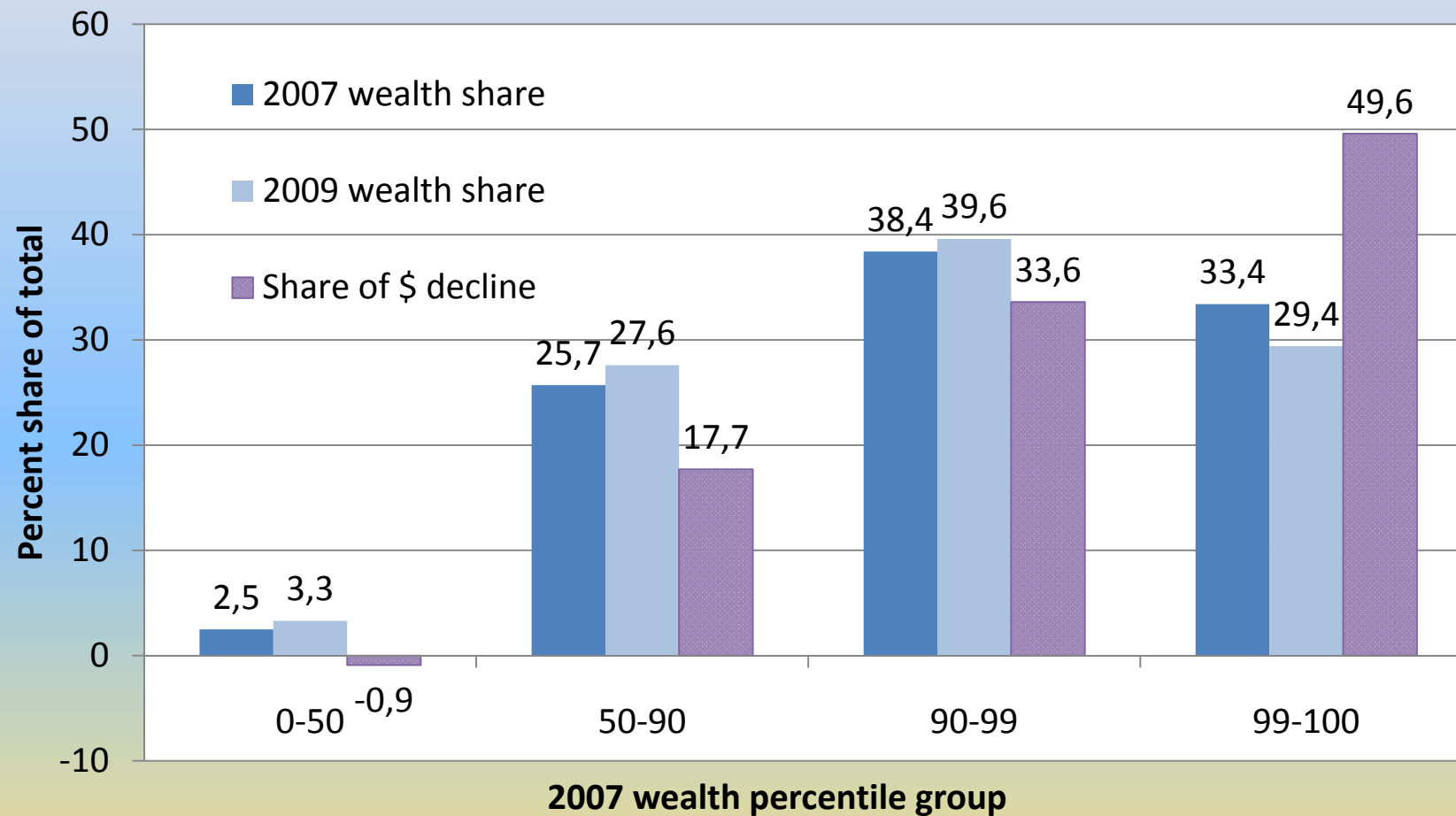
Joint Normalized NW Distribution
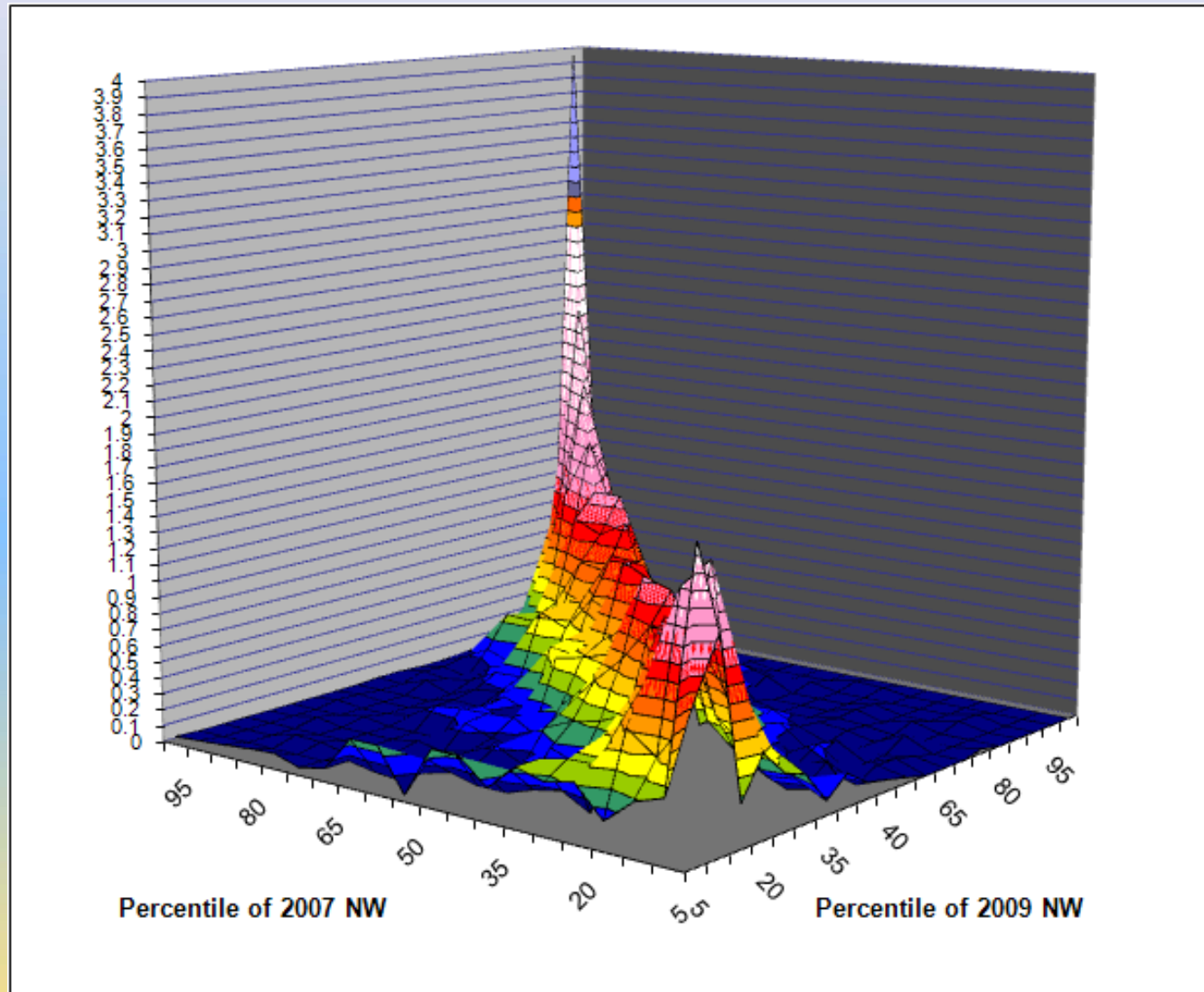
2007-2009
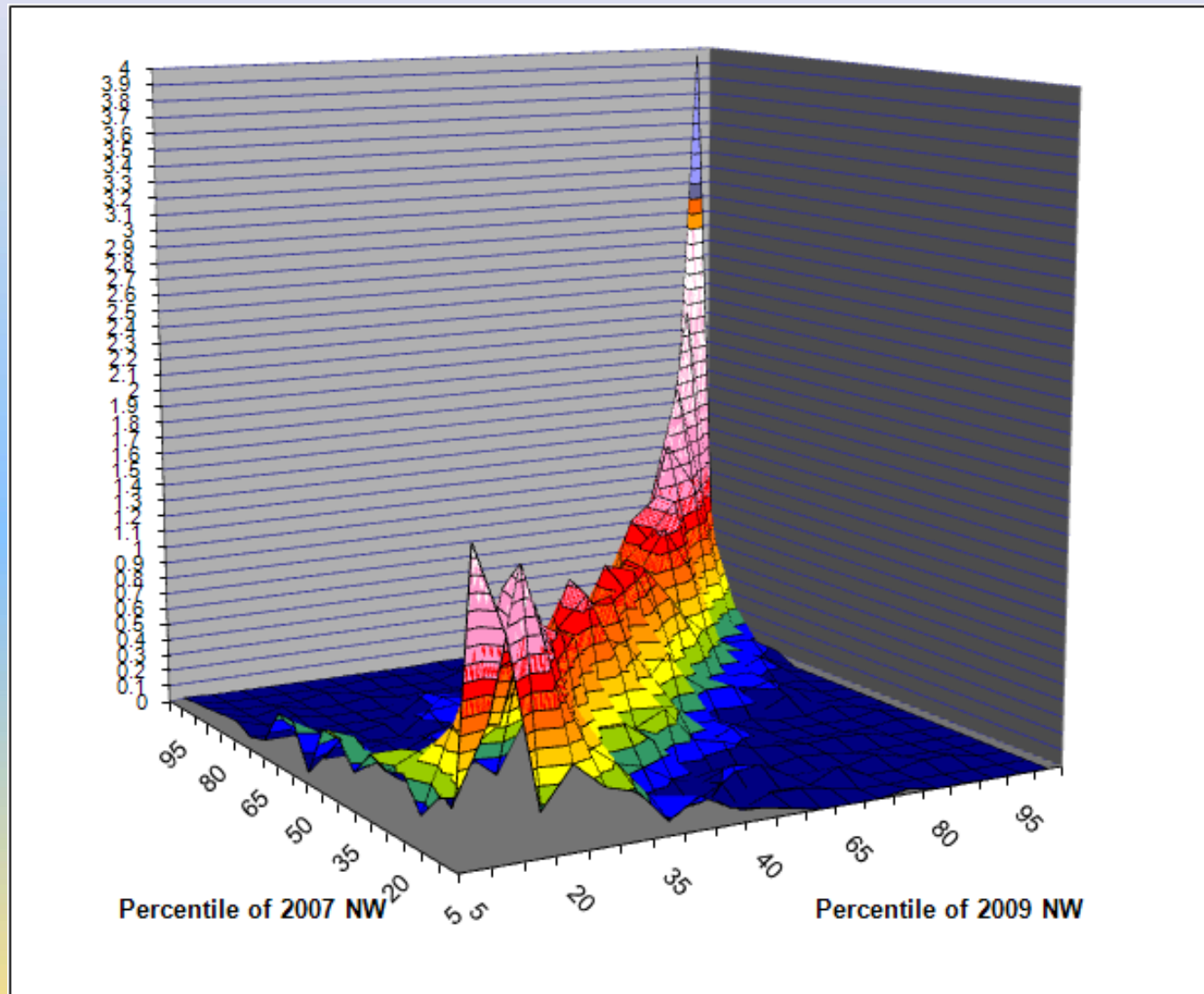
Joint Normalized NW Distribution

2007-2009

Wealth Transition, 2007-2009

2007 net worth group

2009 net worth group

- [0-25)
- (25-50]
- (50-75]
- (75-100]

Wealth Transition, 2007-2009

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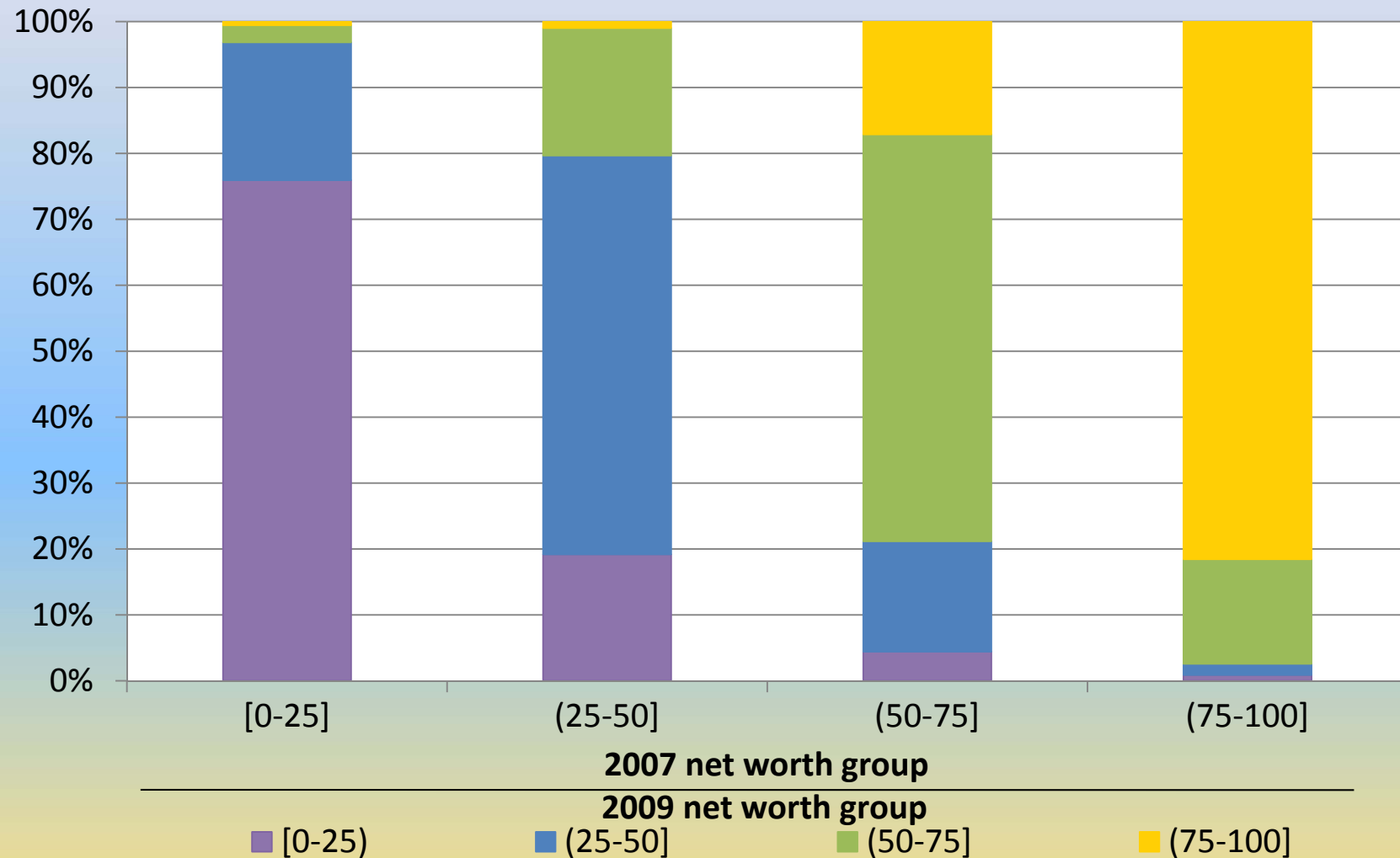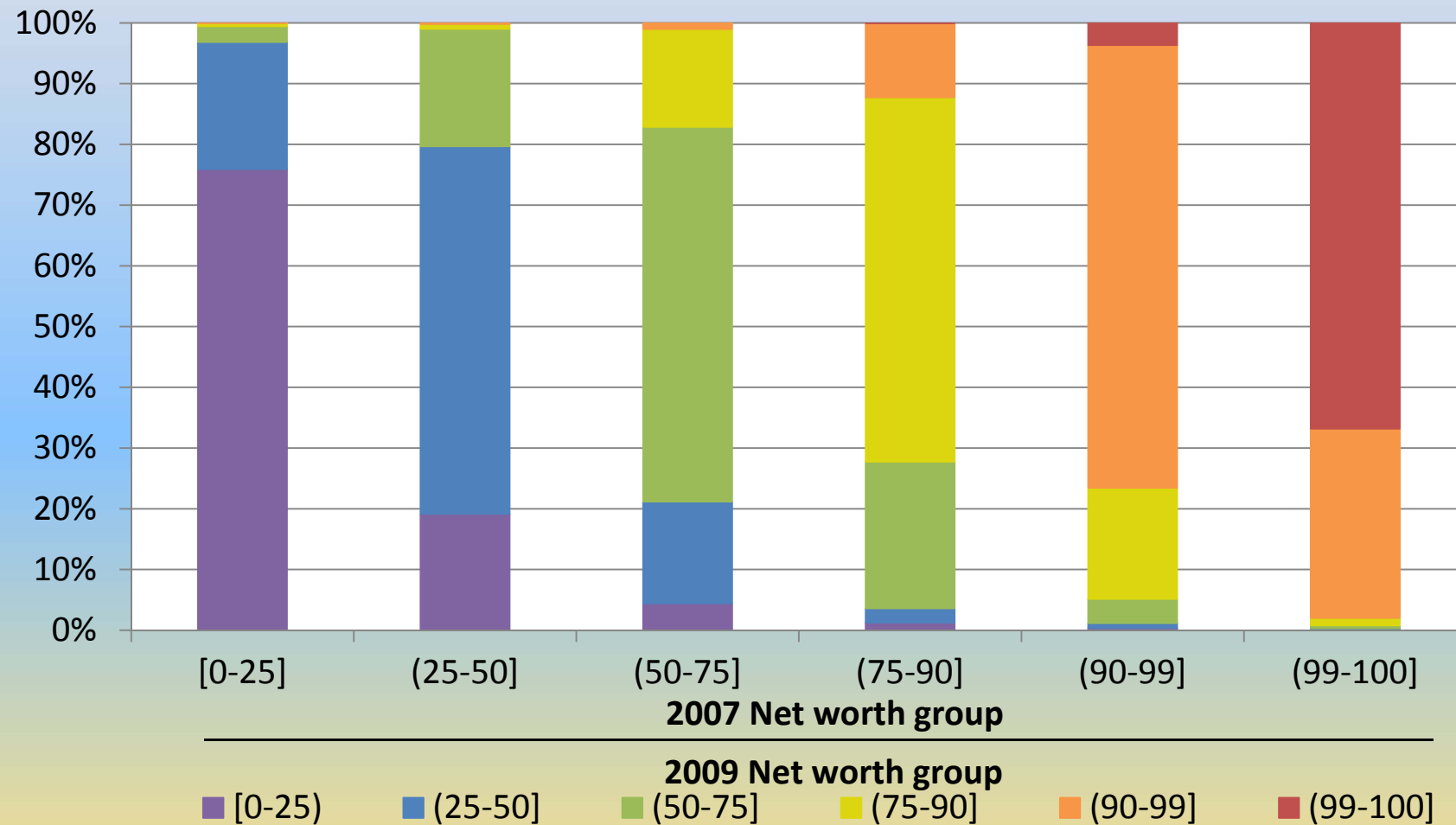
Forbes Rank: 2007 vs. 2009

61 not in 2009

Mean change -$700 million
Mean % change: -13.6%

Median change: -$400
Median % change: -18.5%

Of those in both years:
74.4% had losses
16.8% had gains
6.8% had no change

2007 rank

2009 rank

61 new in 2009
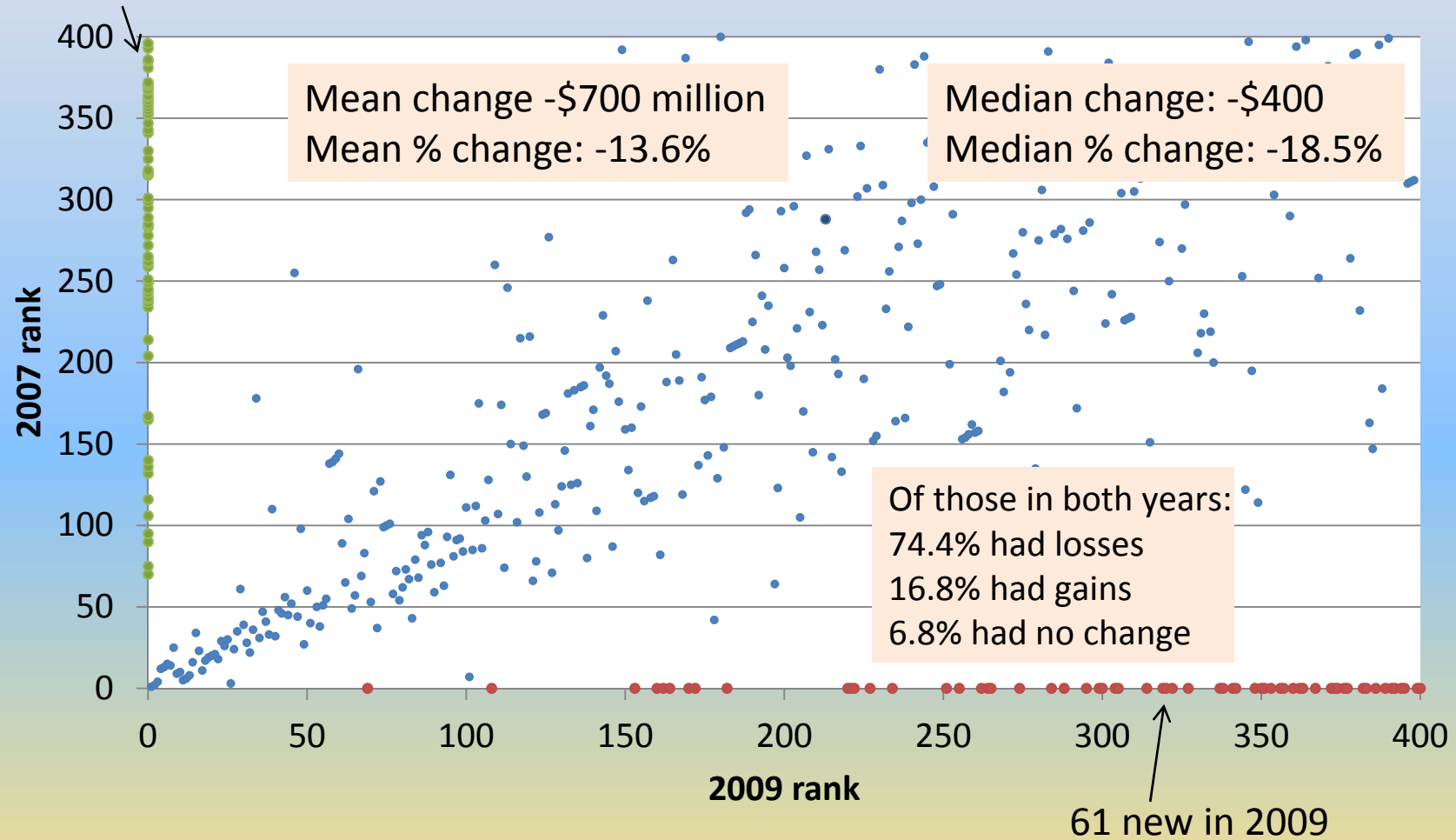
Statistics on Forbes Wealth Measure

	2007	2009	% change
Maximum wealth	$59 billion	$50 billion	-18%
Minimum wealth	$1.3 billion	$950 million	-27%

61 cases in 2009 not present in 2007
61 cases in 2007 not present in 2009

LEGEND: Change 2007-2009

■ Moved down at least one percentile group

■ Same percentile group

■ Moved up at least one percentile group
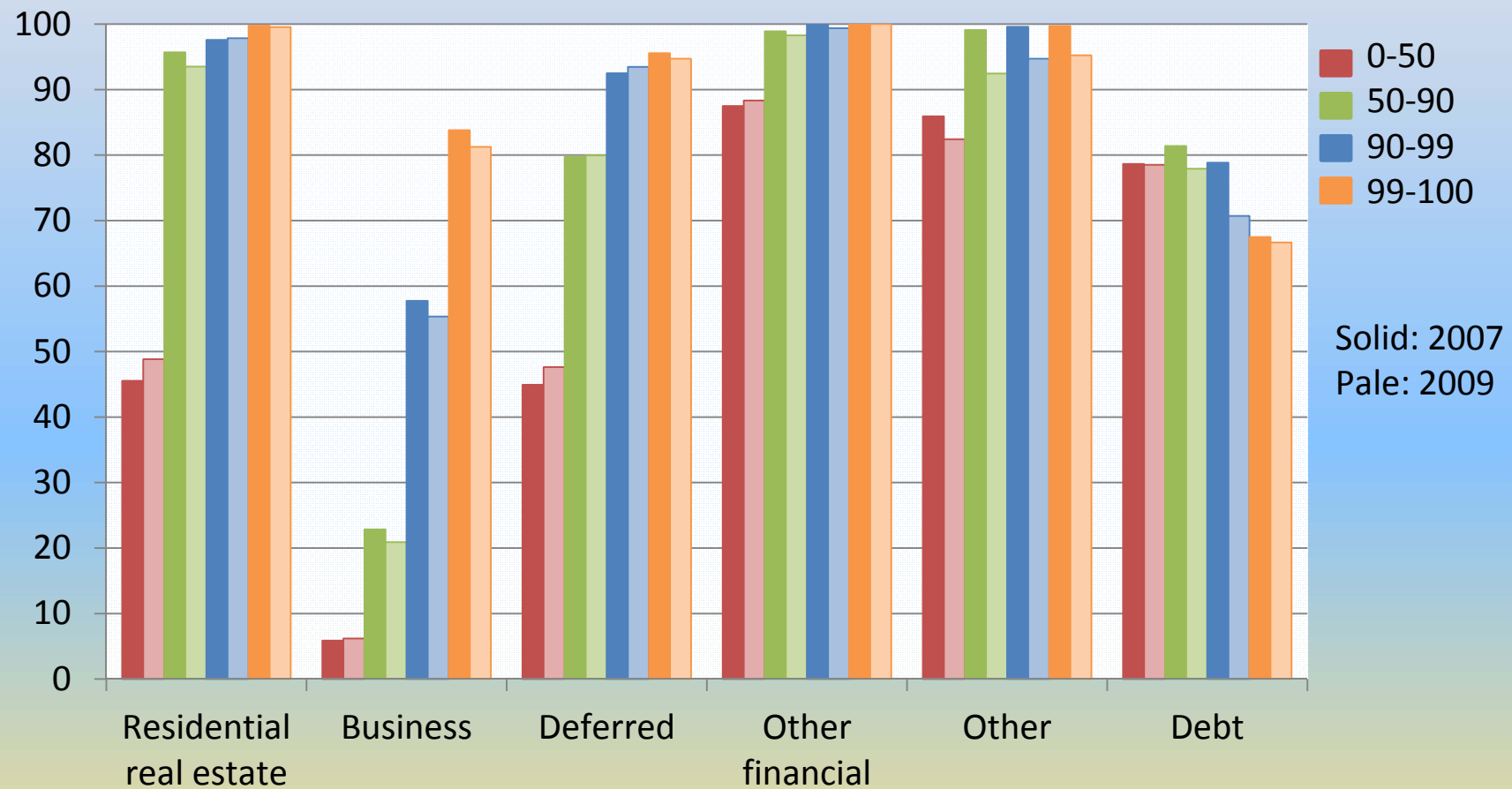
Percent in Group Having Dollar Losses 2007-2009
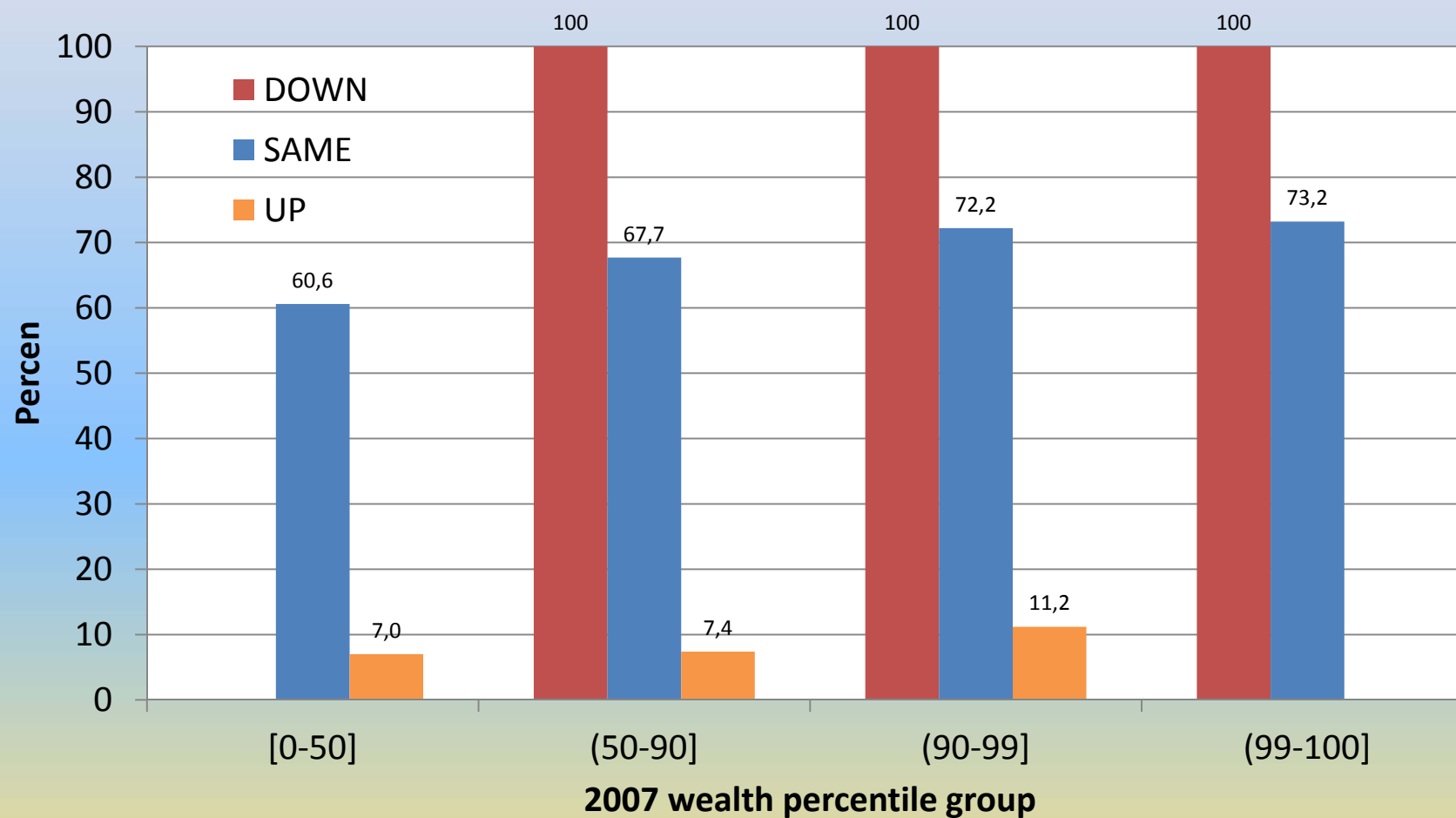
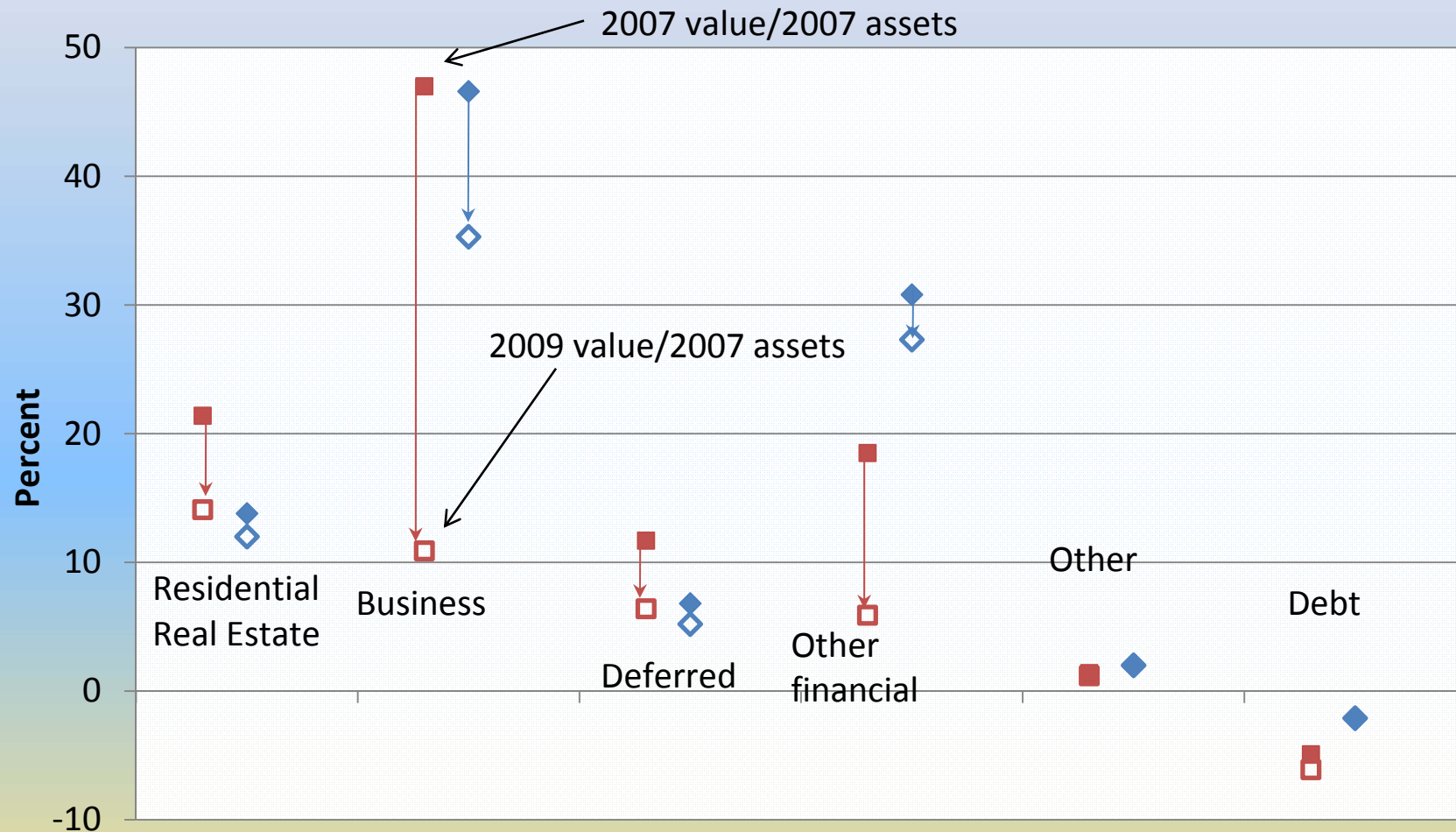# Important Stylized Facts on Ownership and Wealth

- In 2007 and 2009:
  - Home ownership <50% for the least wealthy 50% and near 100% for wealthier groups
  - Business ownership/investment rises strongly with wealth—about 80% among wealthiest 1%
  - 90-100% have some type of financial asset
  - Only half of least wealthy 50%, but 80-90% other have some sort of deferred asset
  - 60-70% of all groups have some type of debt

- Minimal change in ownership of portfolio items
  - 54 percent of all families reported making no changes at all
  - Some increase in homeownership for least wealthy 50%
- Very little change in debt holdings
- **Wealth shifts apparently mostly driven by changes in valuation**

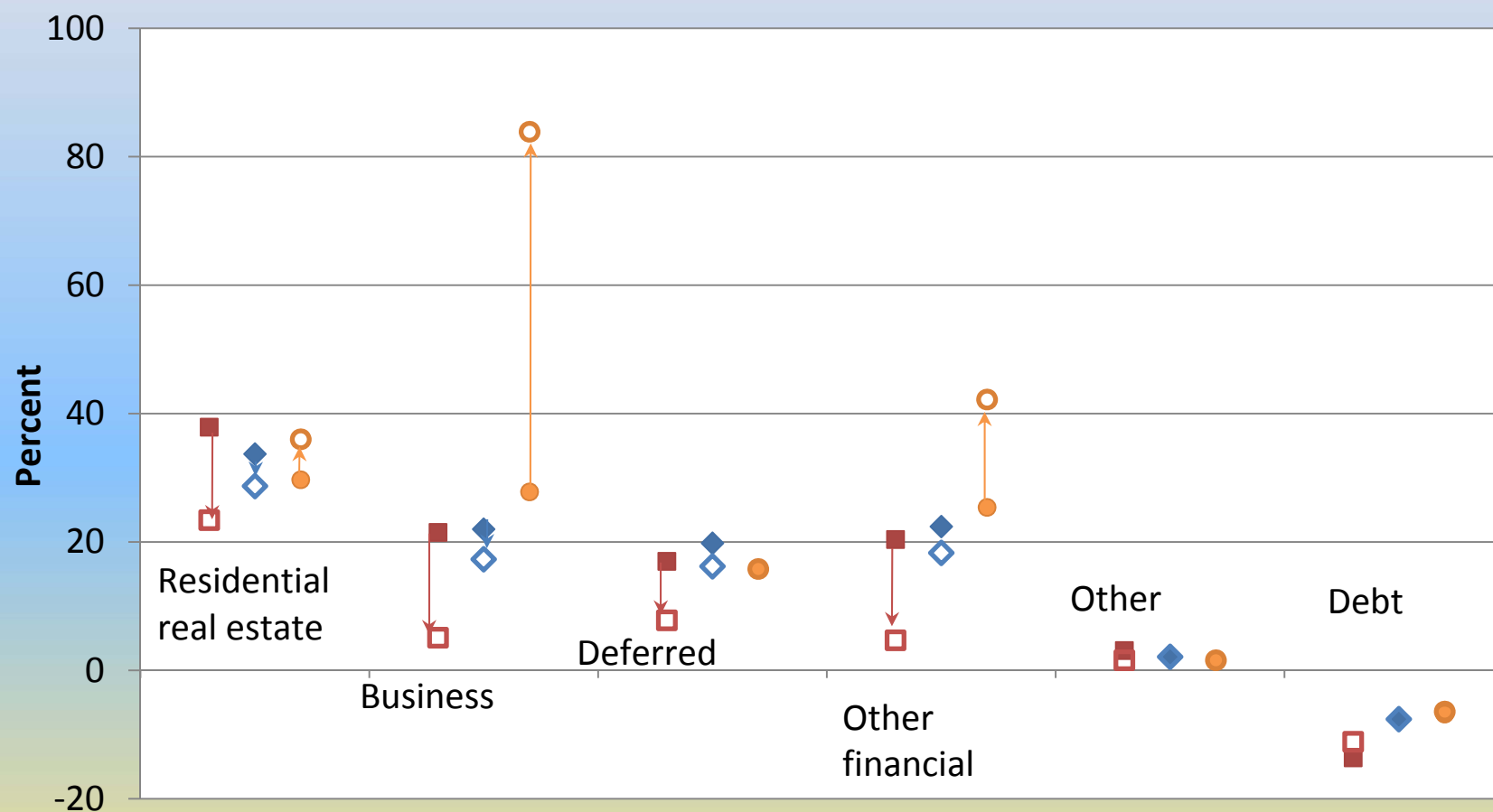# Ownership Rates, by 2007 Wealth Group

Legend: 0-50, 50-90, 90-99, 99-100

Solid: 2007
Pale: 2009

Categories: Residential real estate, Business, Deferred, Other financial, Other, Debt

Items as Share of Total 2007 Assets
Wealthiest 1% in 2007

2007 value/2007 assets

2009 value/2007 assets

Percent

Residential Real Estate

Business

Deferred

Other financial

Other

Debt

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Items as Share of Total 2007 Assets

90th-99th Percentiles in 2007

Items as Share of Total 2007 Assets

50th-90th Percentiles in 2007
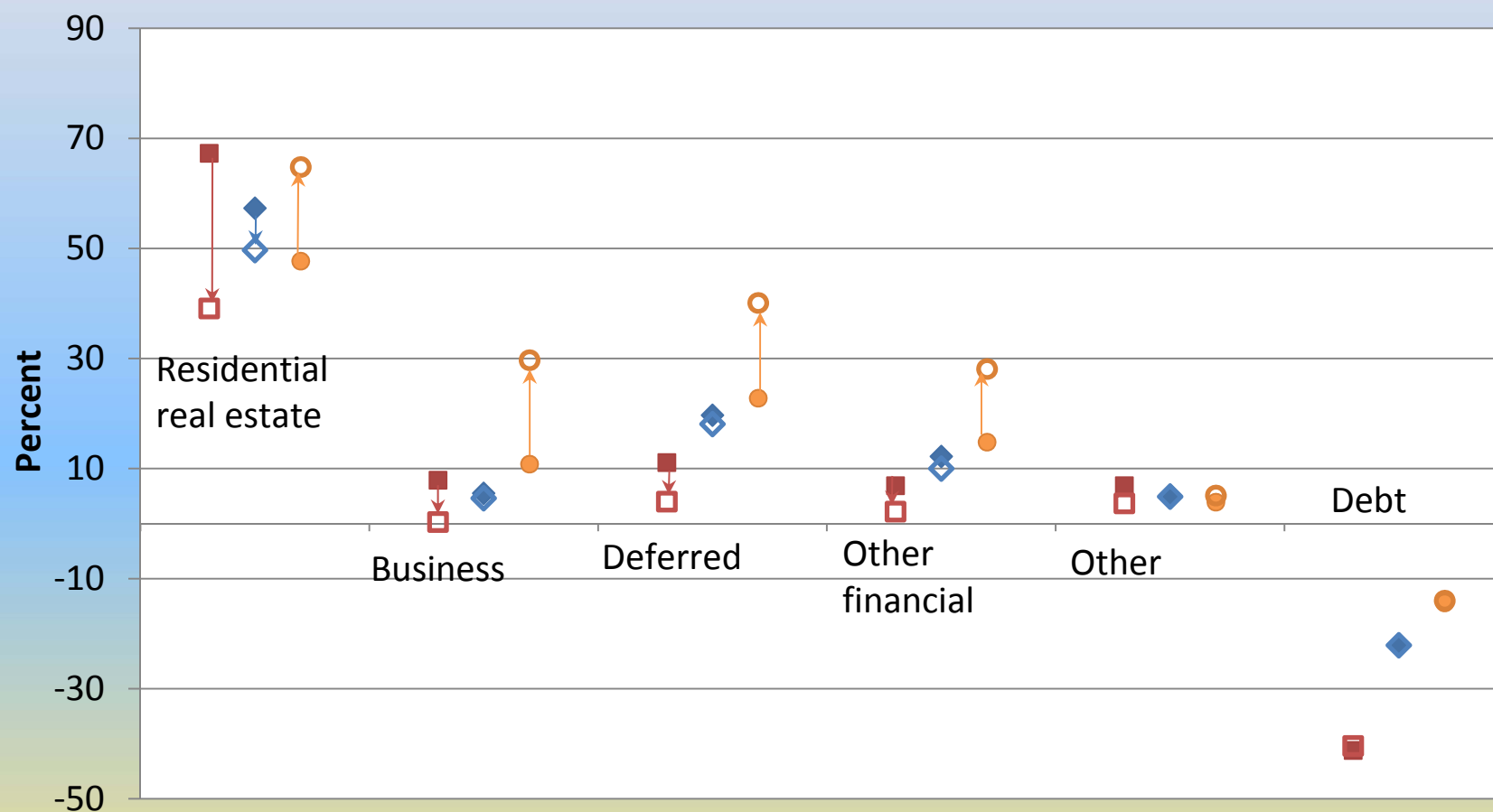
Items as Share of Total 2007 Assets
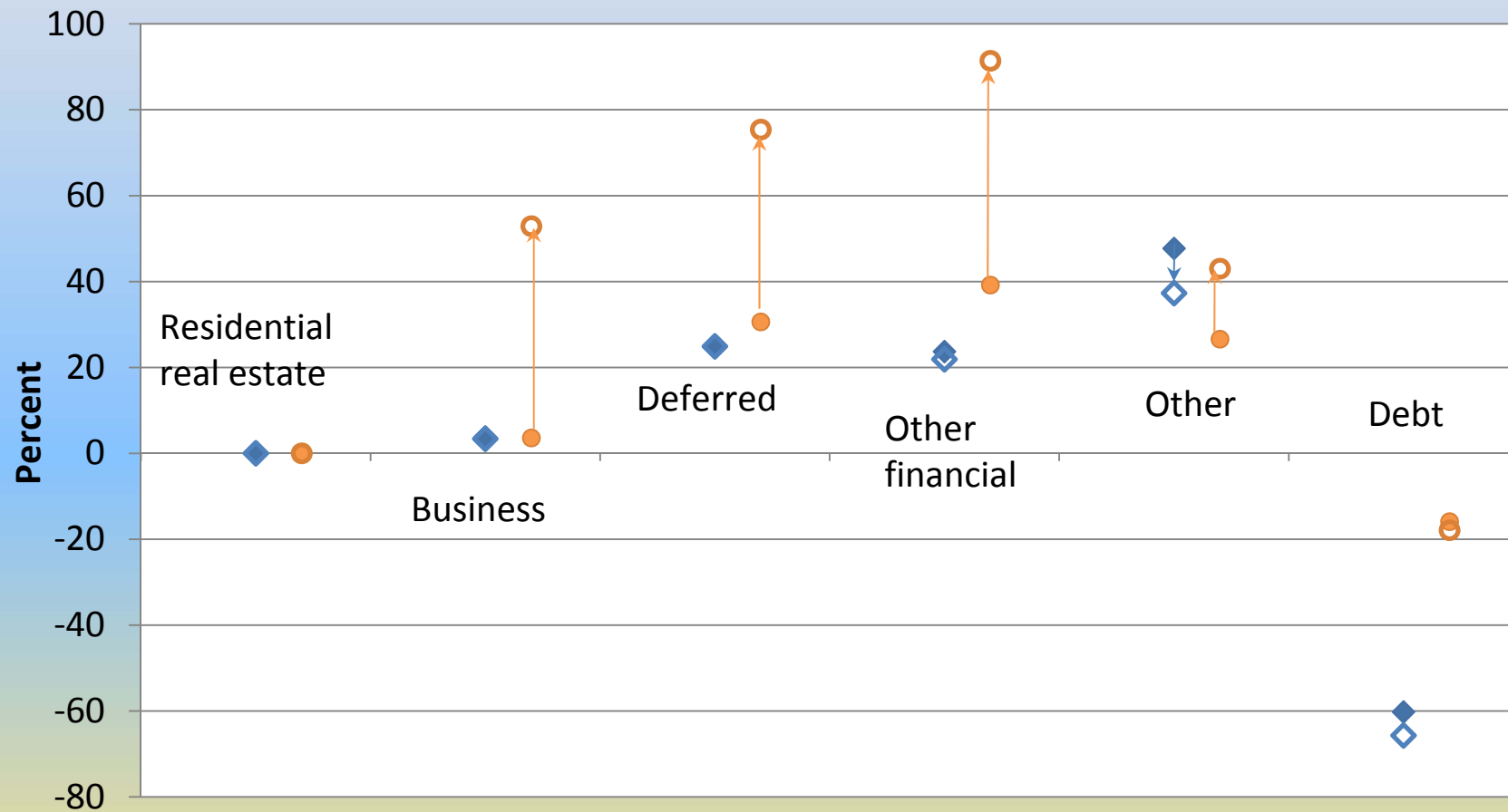## 1st-50th Percentiles in 2007

Percent

120
100
80
60
40
20
0
-20
-40
-60
-80

Residential real estate

Business

Deferred

Other financial

Other

Debt
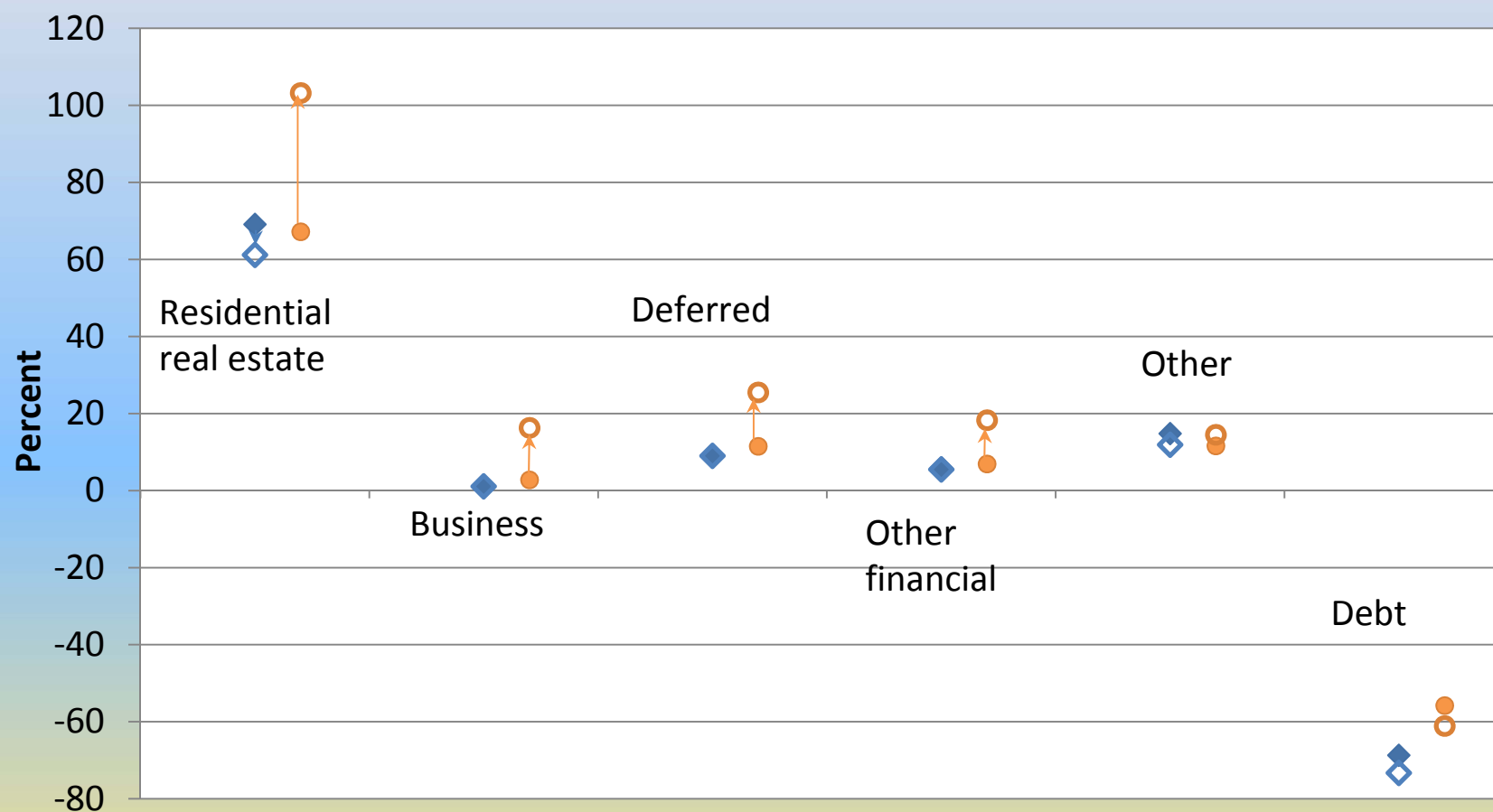
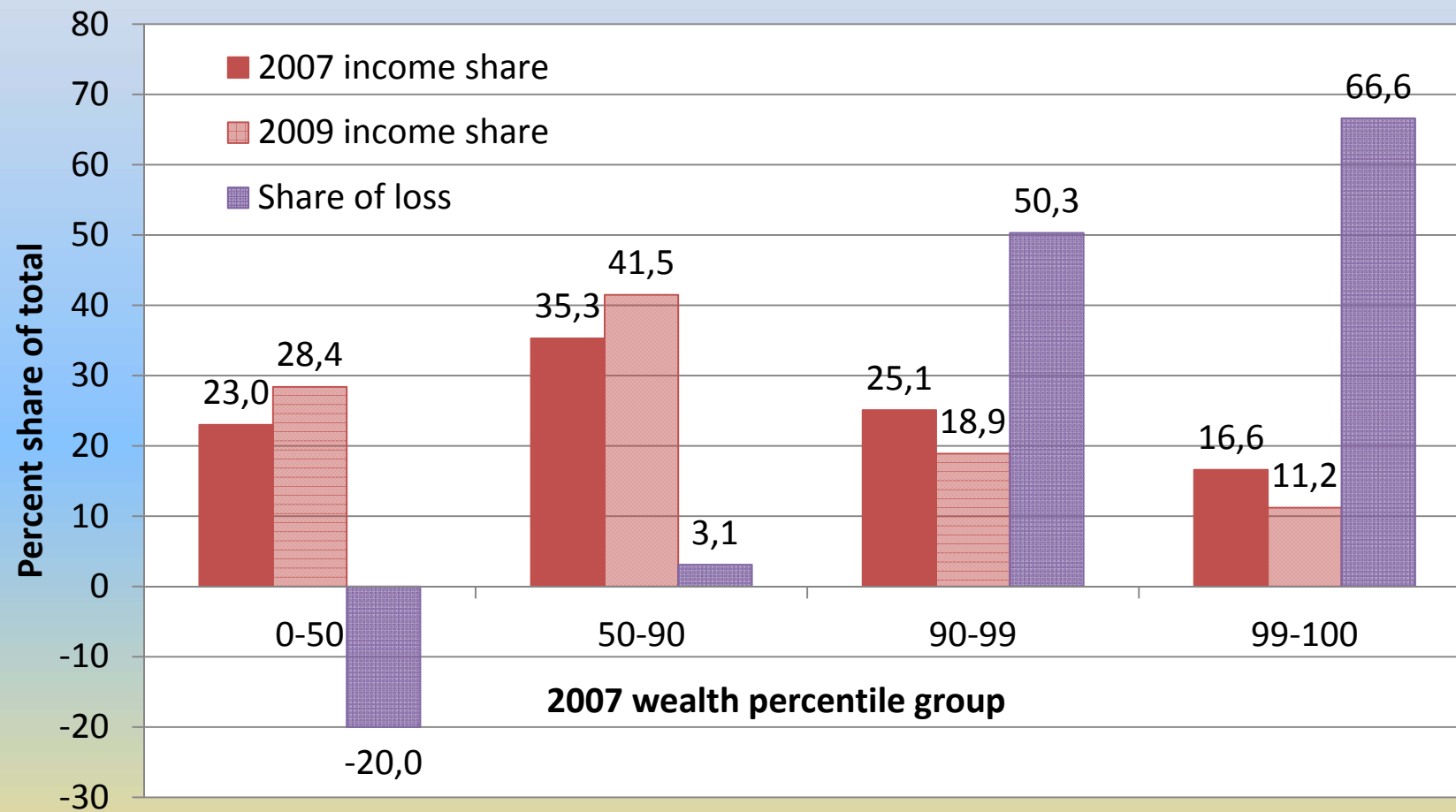# Items as Share of Total 2007 Assets

1st-50th Percentiles in 2007: Not Homeowner Either Year

Other Factors

- Income changes
- Size of losses relative to usual income
- Signs of increased risk aversion
- Asymmetric response to changes in asset valuation
- Differing expectations

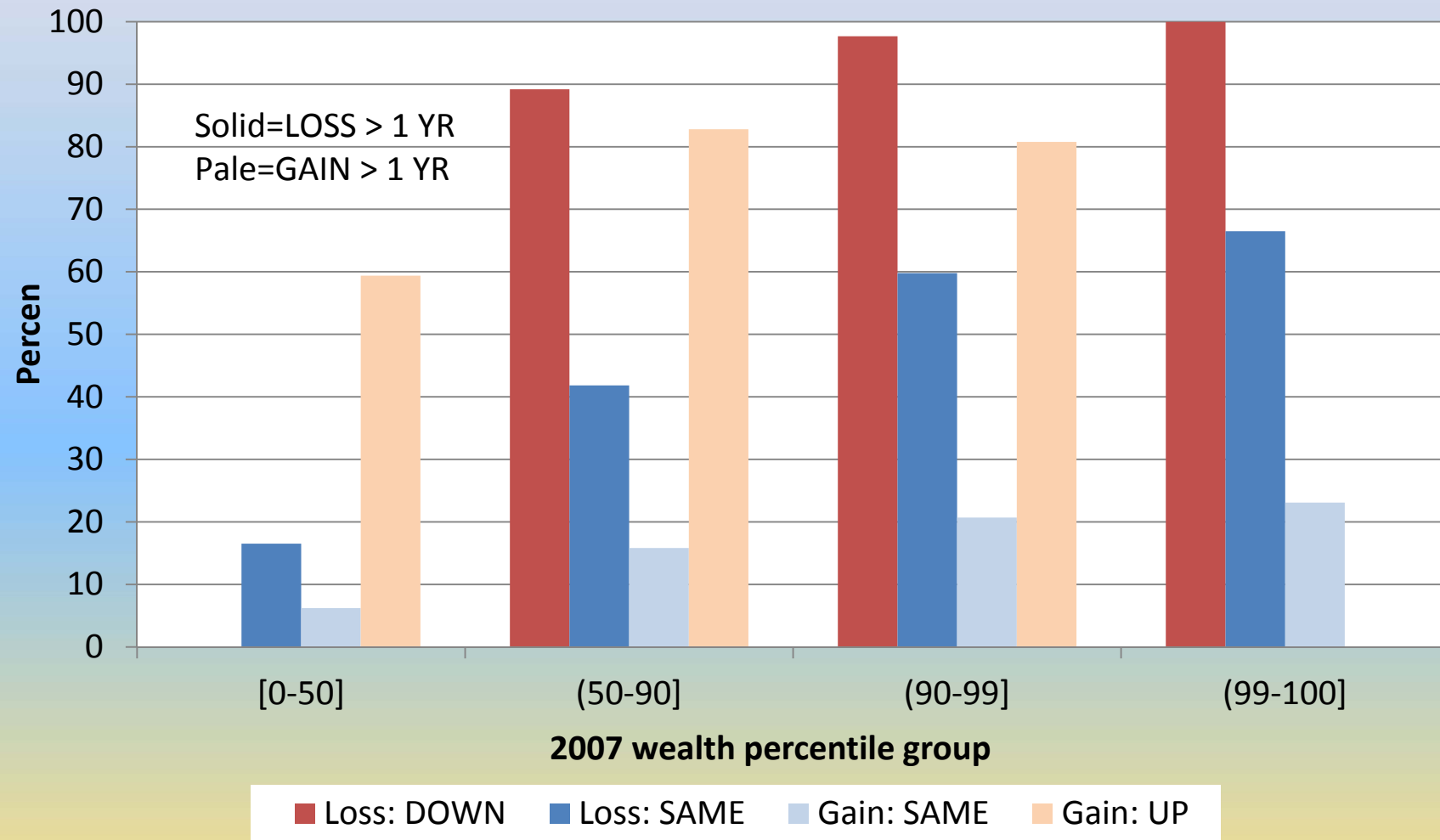# Share of Total Income
By 2007 Wealth Percentile Groups

Income from 2001-2010

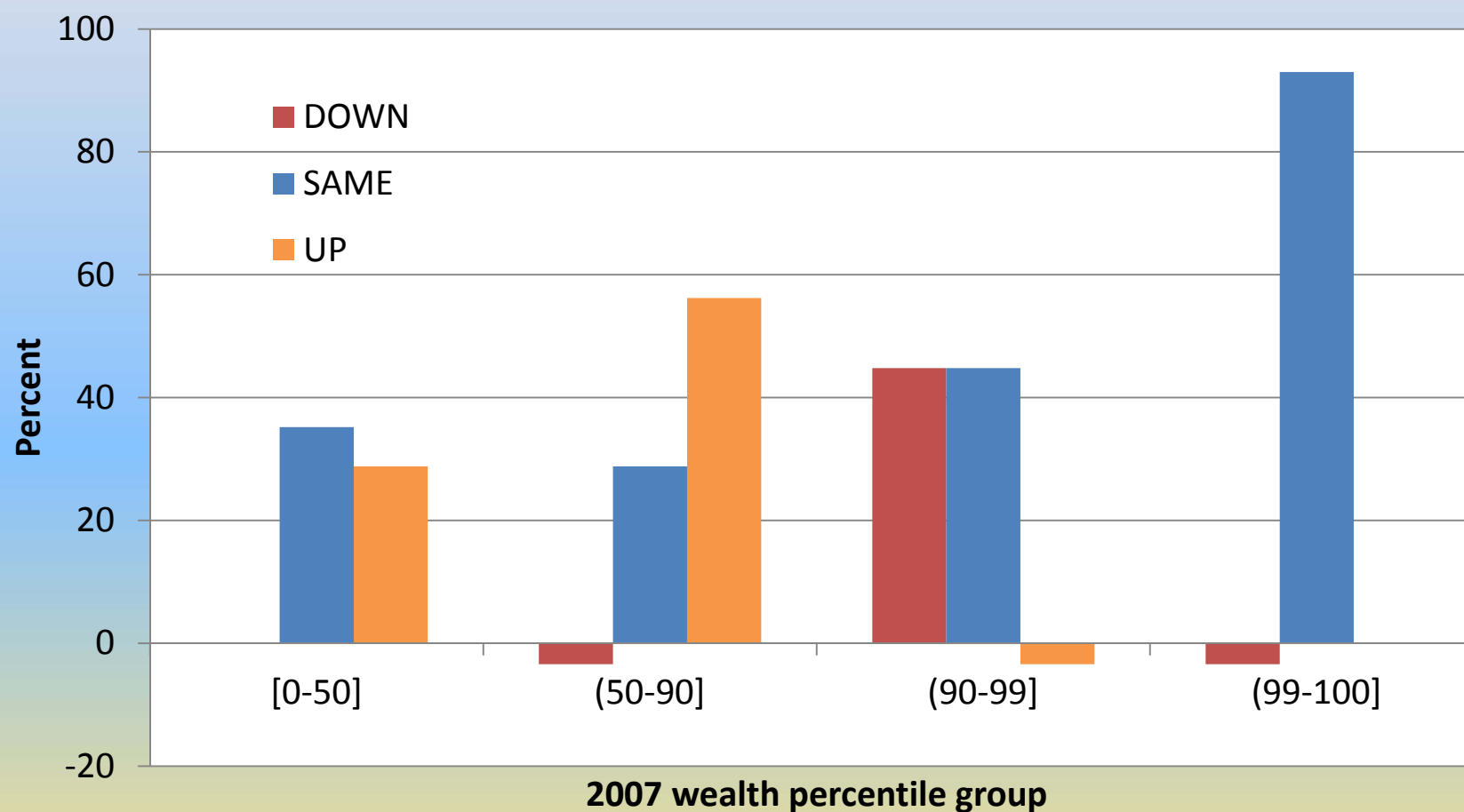- Wealth-income relationship disturbed
  - For example:

Median income by wealth percentile group (thousands $)		
Year	Wealth percentile group for year	
	0-10	10-30
2001	19.0	28.6
2004	23.2	26.7
2007	**22.7**	**28.2**
2009	**39.8**	**24.8**
2010	32.9	22.1

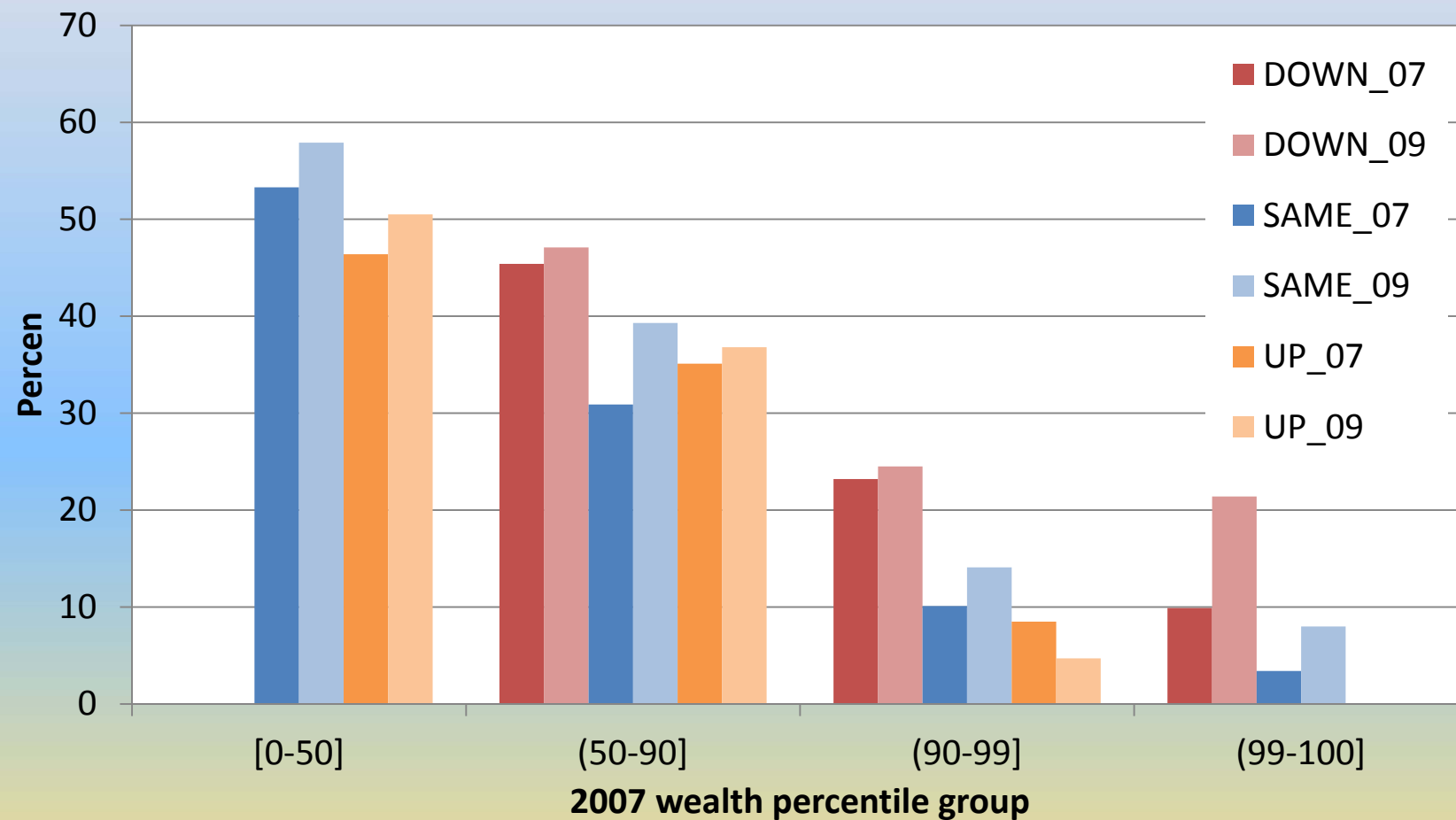# Percent with Loss/Gain > 1 Year of Usual Income

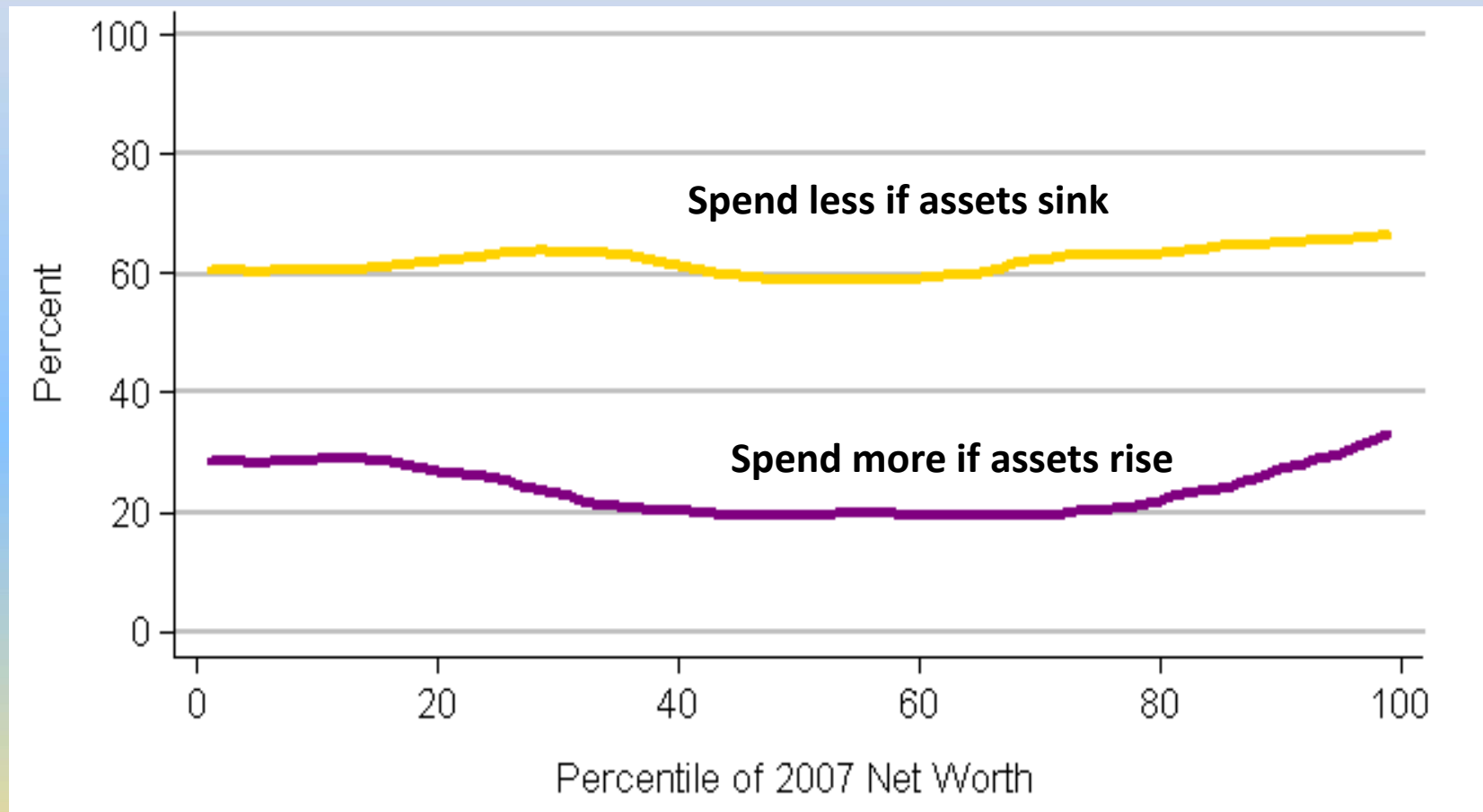

"Gain: DOWN" and "Loss: UP" are suppressed

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Median Percent Change in Desired Precautionary Saving, 2007-2009

Unwilling to Take Financial Risk

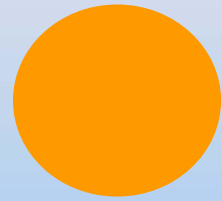# Spend More (Less) if Wealth Rises (Falls)

Conclusions

- Data quality is the highest objective
- Survey operations are complex operations
- **The technical apparatus of ex-post repair may be intellectually attractive, but it is only a sad accommodation to failure**

- **Stay out of the emergency room!**

- Strong message in the data is heterogeneity of wealth outcomes: winners **and** losers
- Overall, wealth fell, but distribution of shares little changed 2007-2009
  - Substantial rearrangement within the distribution
- Changes in relationship between income and wealth
- Increased risk aversion, desire for higher buffer saving, asymmetry in spending as a result of wealth changes
  - Implications for the speed of economic recovery?

Thank you!

QUESTIONS
(Please)

?????