Measurement Behind Theory

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Theory and Measurement

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  - Theoretical lens
  - Econometric rigor
- Because not everything that counts can be counted

Theory and Measurement

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  - Theoretical lens
  - Econometric rigor
- Because not everything that counts can be counted
- But, this view less evident in current practice

Current Practice

- Mad rush to document new "facts"
- But,
  - There is little theoretical guidance
  - Many of the "facts" are not facts
  - Researchers hastily draw conclusions from them

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- But,
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$\Rightarrow$ Putting the cart before the horse

Facts?

- Most economic data derived from:
  - Accounting data
  - Survey responses
- And should be treated as such

Plan of Lecture

- Provide three cart-before-the-horse examples
- Demonstrate that measurement issues arise if:
  - Accounting and economic concepts differ
  - Survey data measured with error
  - Variables of interest ultimately unmeasurable
- Argue case for relying more on theory and econometrics

“Fact” 1:

Markups are Rising

(or, Labor Shares are Declining)

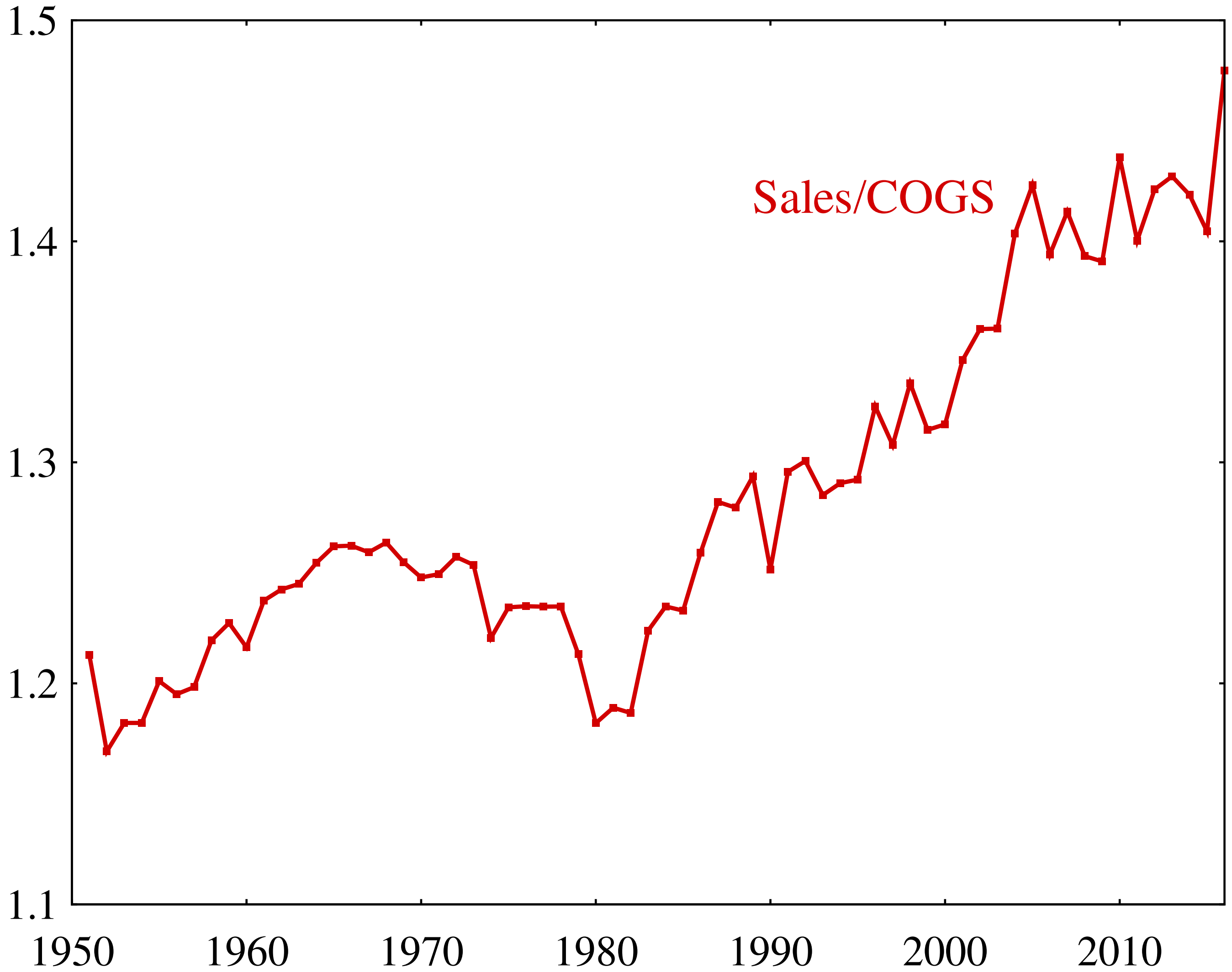
Markups are Rising

- Evidence based on accounting measures:
  - For firm i, time t

$$\text{markup}_{it} \propto \frac{\text{sales}_{it}}{\text{cost of goods sold}_{it}}$$

  - For aggregate, markup is sales-weighted sum over i
- Shows 30 pp rise in aggregate markup since 1950

Markups are Rising



Source: Yao (2018)

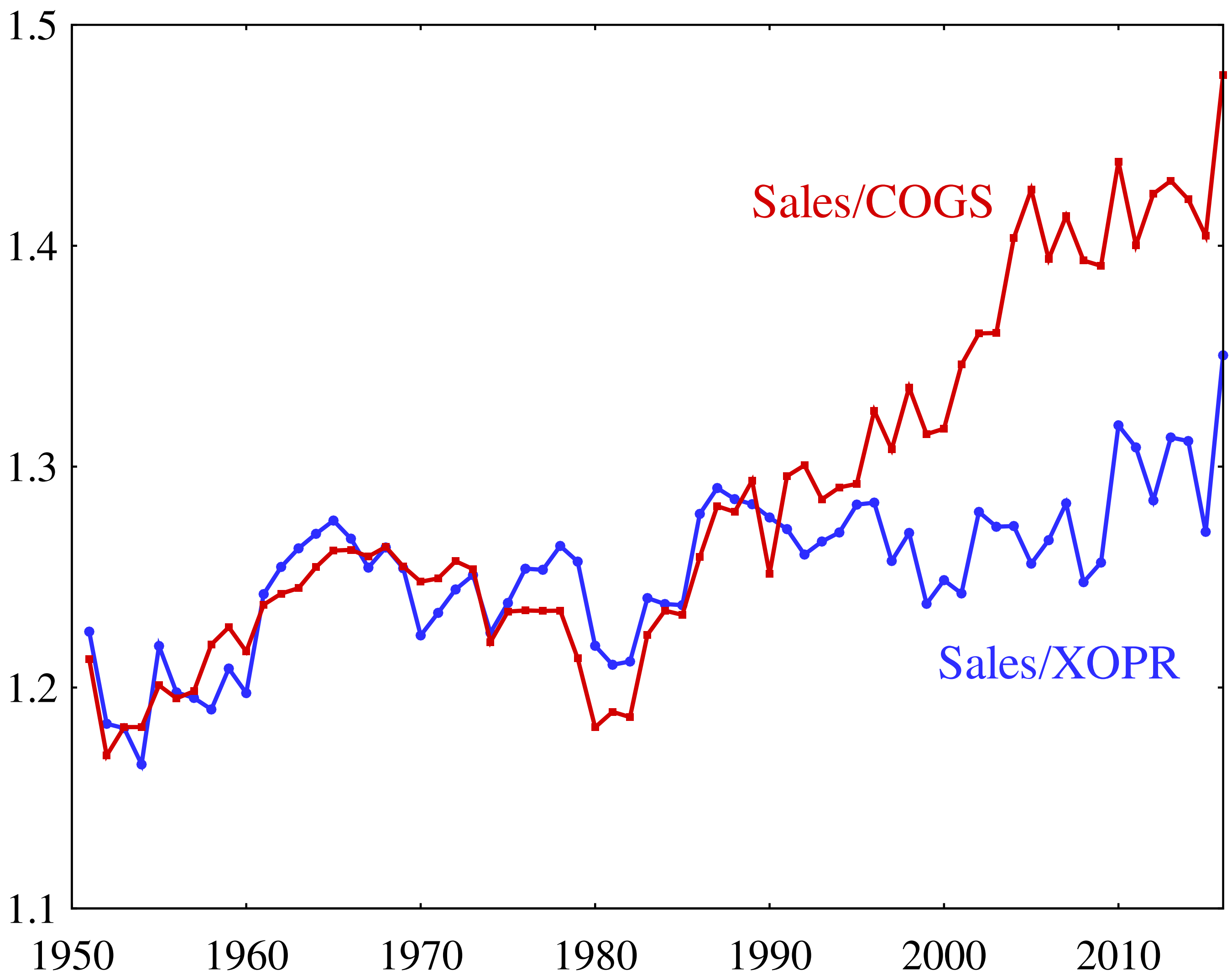
Markups are Rising

- Common interpretation: market power rising

Markups are Rising

- Common interpretation: market power rising
- But, accounting rules/measures:
  - Change over time
  - Miss factors such as intangible capital

Market Power or Accounting?



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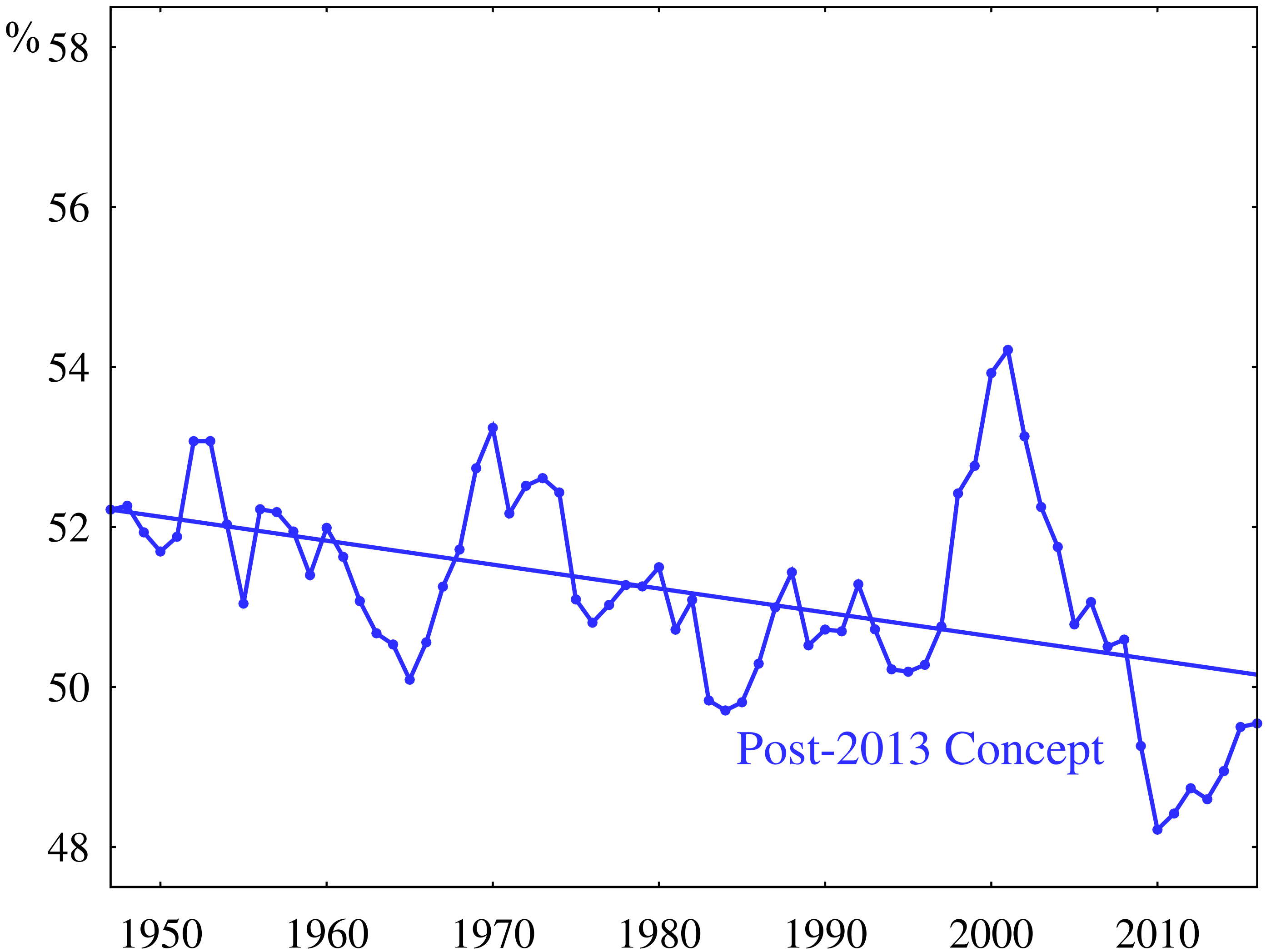
A Related "Fact"

- Labor share is declining

- Evidence based on national accounting measure:

$$\begin{aligned}
&\text{Labor share of GNP} \\
&\qquad = \text{Compensation of Employees} \\
&\qquad + \text{fraction of Proprietors' Income}
\end{aligned}$$

Labor Share Declining



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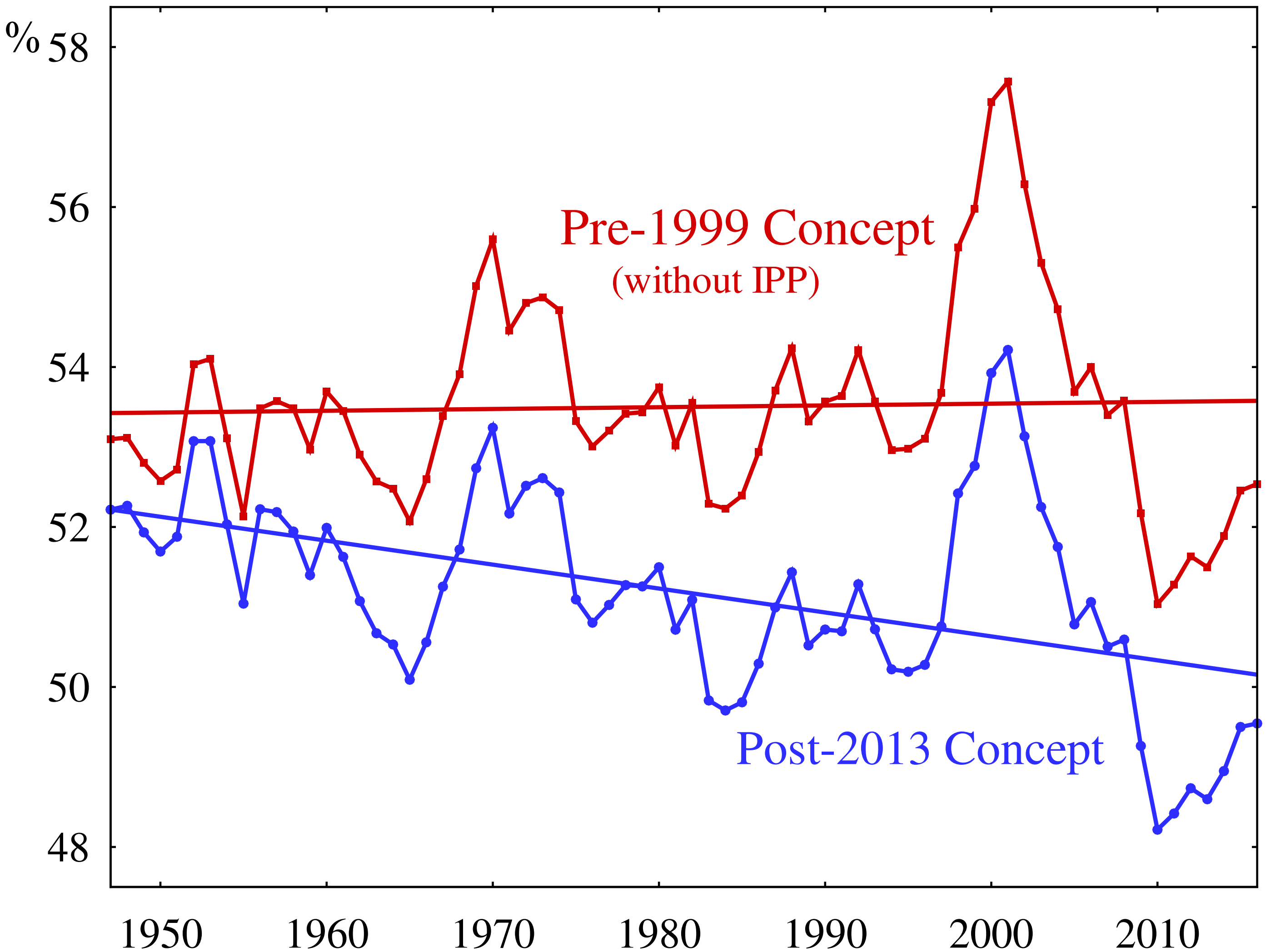

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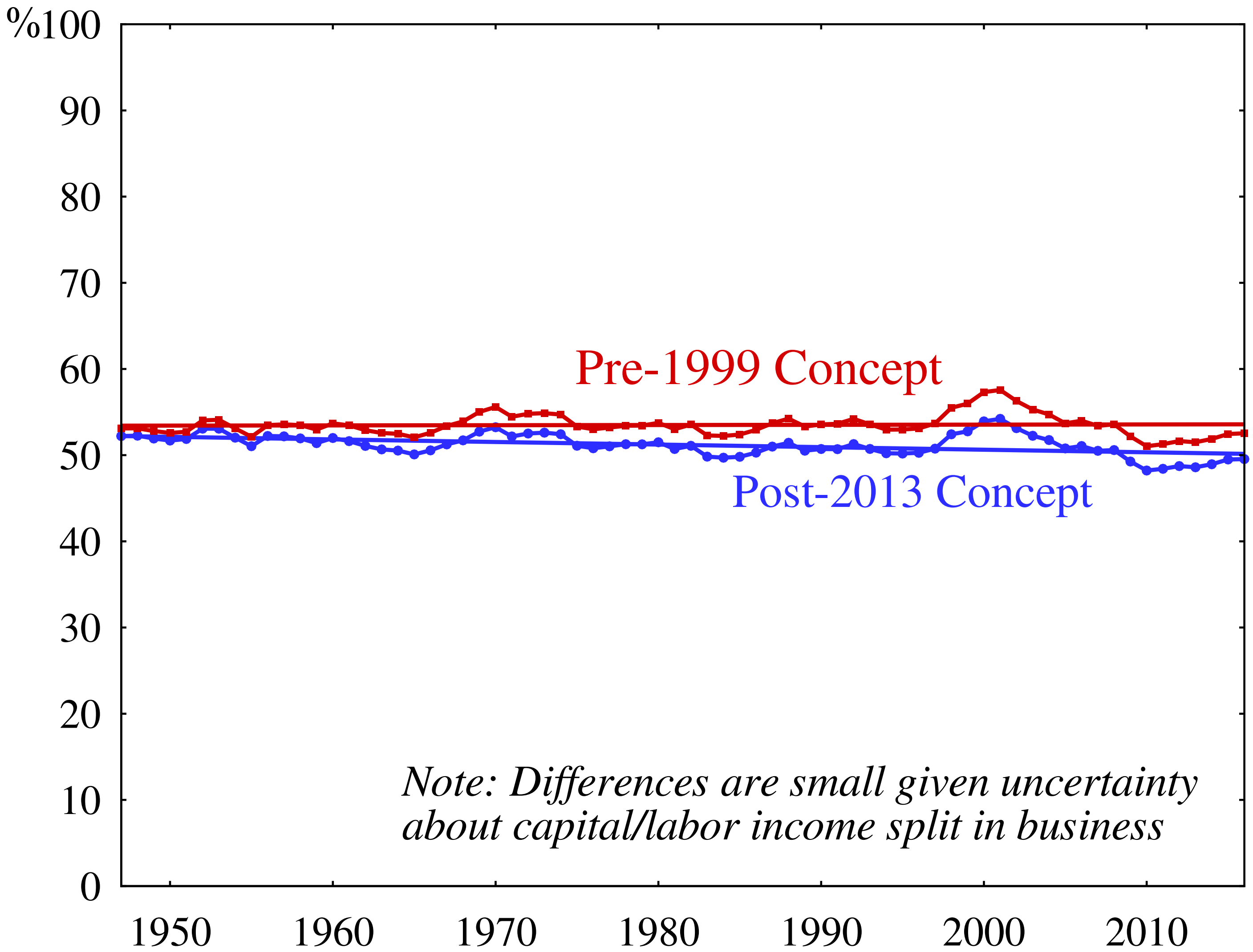


“Fact” 1: Main Take-aways

- Markups and factor shares are accounting measures
- Accounting measures change over time
- Measurement must be guided by theory
  - Construct same statistics in model and data
  - Resist drawing unguided policy conclusions

“Fact” 2:

US Corporations Earn Puzzlingly High Returns on Direct Investment Abroad Relative to Foreigners in US

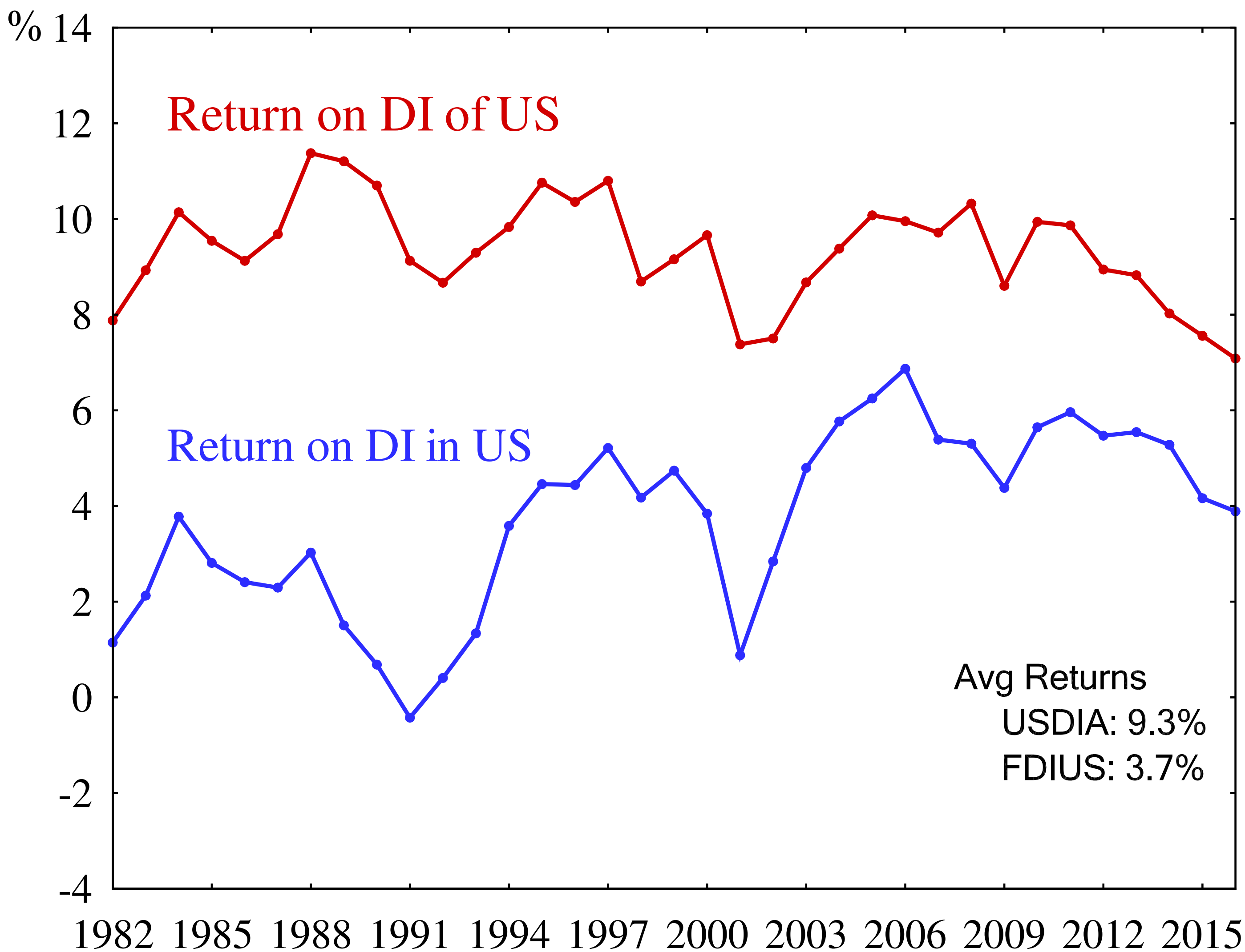
Large Gap in Direct Investment (DI) Returns

- Evidence based on BEA international accounts:

$$\text{DI return} = \frac{\text{DI after-tax income } (\Pi)}{\text{Current cost of capital } (K)}$$

- For 1982–2016:
  - US companies abroad earned 9.3% (USDIA)
  - Foreign companies in US earned 3.7% (FDIUS)

Large Gap in Direct Investment (DI) Returns



Source: Bureau of Economic Analysis

Taxes?

- Tax interpretations
    - US firms legally avoid taxes
    - US firms illegally evade taxes

Taxes or Accounting?

- Tax interpretations
  - US firms legally avoid taxes
  - US firms illegally evade taxes
- Accounting interpretation
  - Multinationals invest in *expensed* intangibles
  - Expensing distorts accounting returns

Tax Avoidance

- Unless costs to moving capital huge,
  - Companies will shift capital until
  - After-tax returns are equated
- Therefore, no resolution to large gap in DI returns

Tax Evasion

- If US companies illegally book
  - Expenses in US
  - Revenues in Ireland
- Then we can rationalize <u>any</u> gap in returns

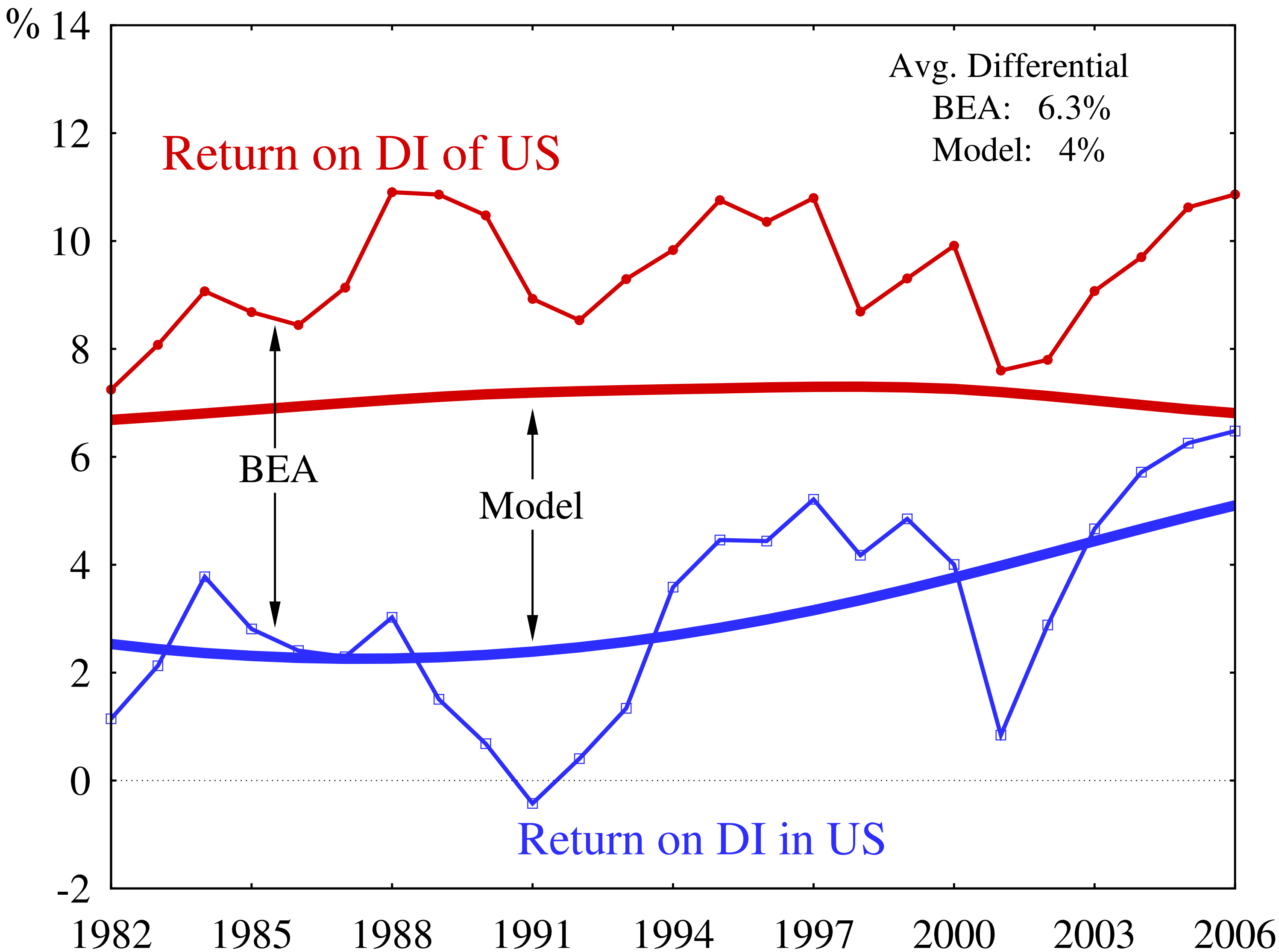
Accounting for IPP?

- Since multinationals invest in (expensed) intangibles, eg,
  - R&D
  - Brands
  - Organization capital
- DI accounting returns can be higher/lower than actual
  - Higher if multinational parents invest (low K)
  - Lower if foreign subsidiaries invest (low Π)

How To Quantify Roles for Gap?

- Develop theory with
  - Opportunities for tax avoidance/evasion
  - Multinationals investing in intellectual property
- Construct model accounts in same way as BEA

Mismeasurement Alone Gets 60% of Gap



Source: McGrattan and Prescott (2010)

“Fact” 2: Main Take-aways

- Direct investment returns are accounting measures
- Accounting returns miss some income and some capital
- Measurement must be guided by theory
  - Construct same statistics in model and data
  - Resist drawing unguided policy conclusions

“Fact” 3:

Private Businesses Earn Puzzlingly Low Returns Relative to Publicly-traded Firms

Private Returns Not Much Higher

- Evidence based on holding-period returns
  - CRSP publicly-traded:

$$R_{t,t+1} = \underbrace{\sum\nolimits_i \omega_{it}^v \frac{NI_{it}}{V_{it}}}_{\text{Income yield}} + \underbrace{\sum\nolimits_i \omega_{it}^v \frac{V_{it+1}}{V_{it}}}_{\text{Capital gain}}$$

where NI=net income, V=value, $\omega_i^v = \omega_i V_i / \sum_j \omega_j V_j$

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- SCF private business:

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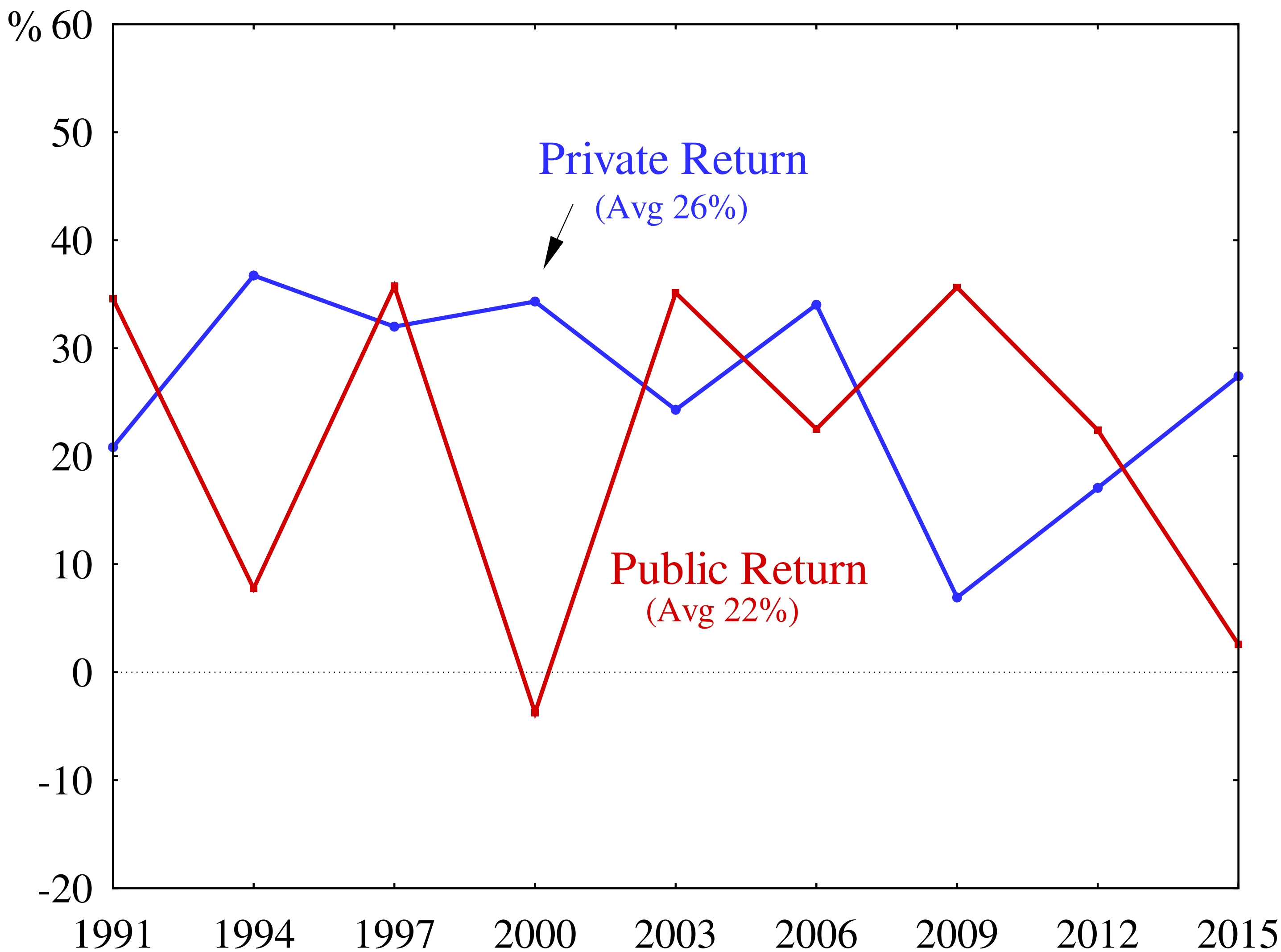
Private Returns Not Much Higher



Source: Bhandari, Birinci, McGrattan, and See (2018)

Nonpecuniary Benefits?

- Nonpecuniary benefits, eg,
  - Being one's own boss
  - Having flexible schedules

Nonpecuniary Benefits or Mismeasurement?

- Nonpecuniary benefits, eg,
  - Being one's own boss
  - Having flexible schedules
- Measurement issues for private business
  - Few business sales
  - Limited data on net incomes

What Does SCF Report?

- SCF households with *pass-through* income asked

1. *What was the business's total net income before taxes?*

   Partnership: IRS Form 1065, Line 22

   Sole proprietorship: IRS Form 1040, Sch. C, Line 31

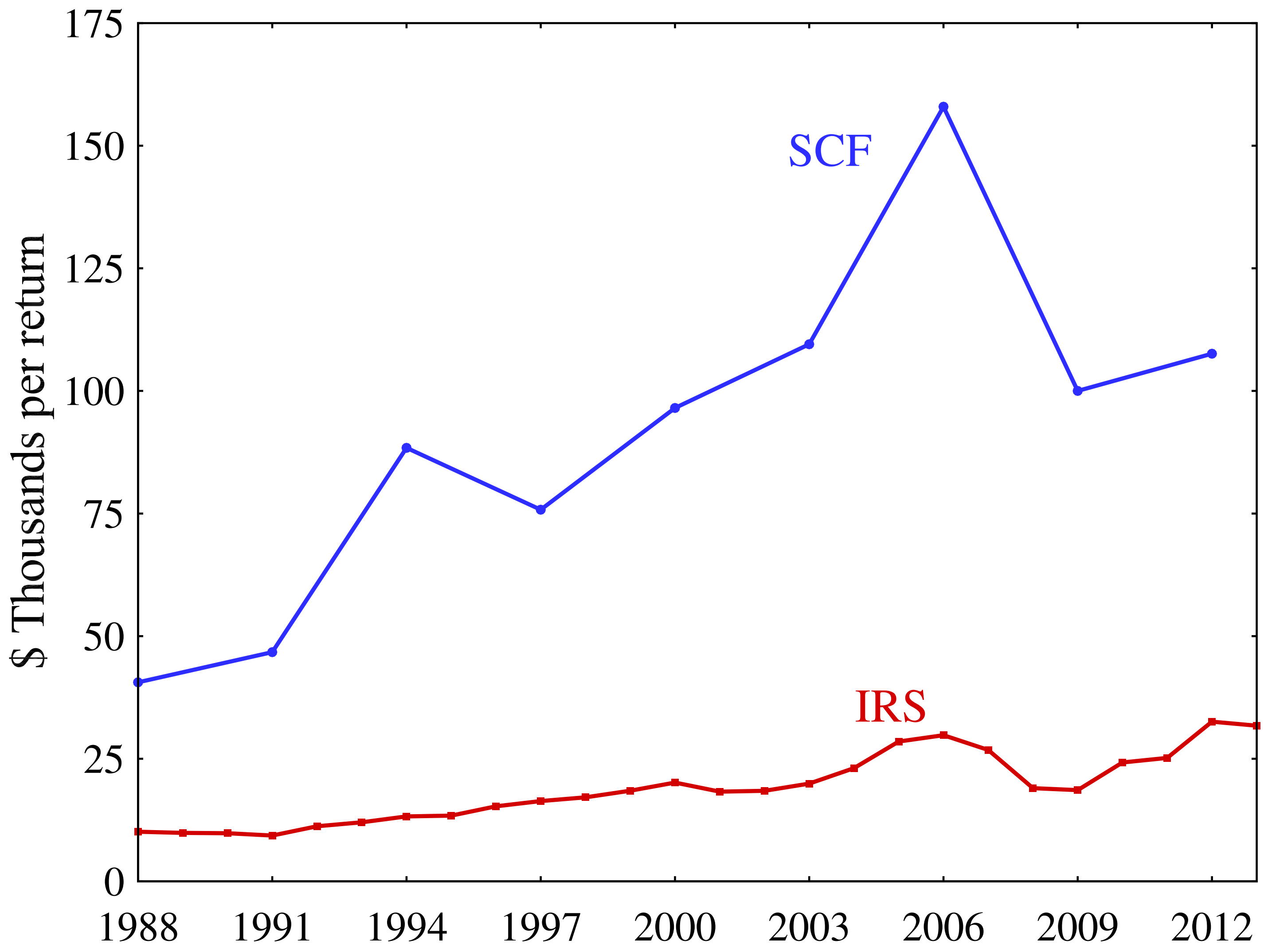
   S-corporation: IRS Form 1120S, Line 21

   $\Rightarrow$ Can compare NI to IRS tax and audit data

2. *If sold business, what would you get for it?*

   $\Rightarrow$ Can compare NI/V ratio to businesses that sell

SCF Incomes Overstated ($\approx 5\ \times$)



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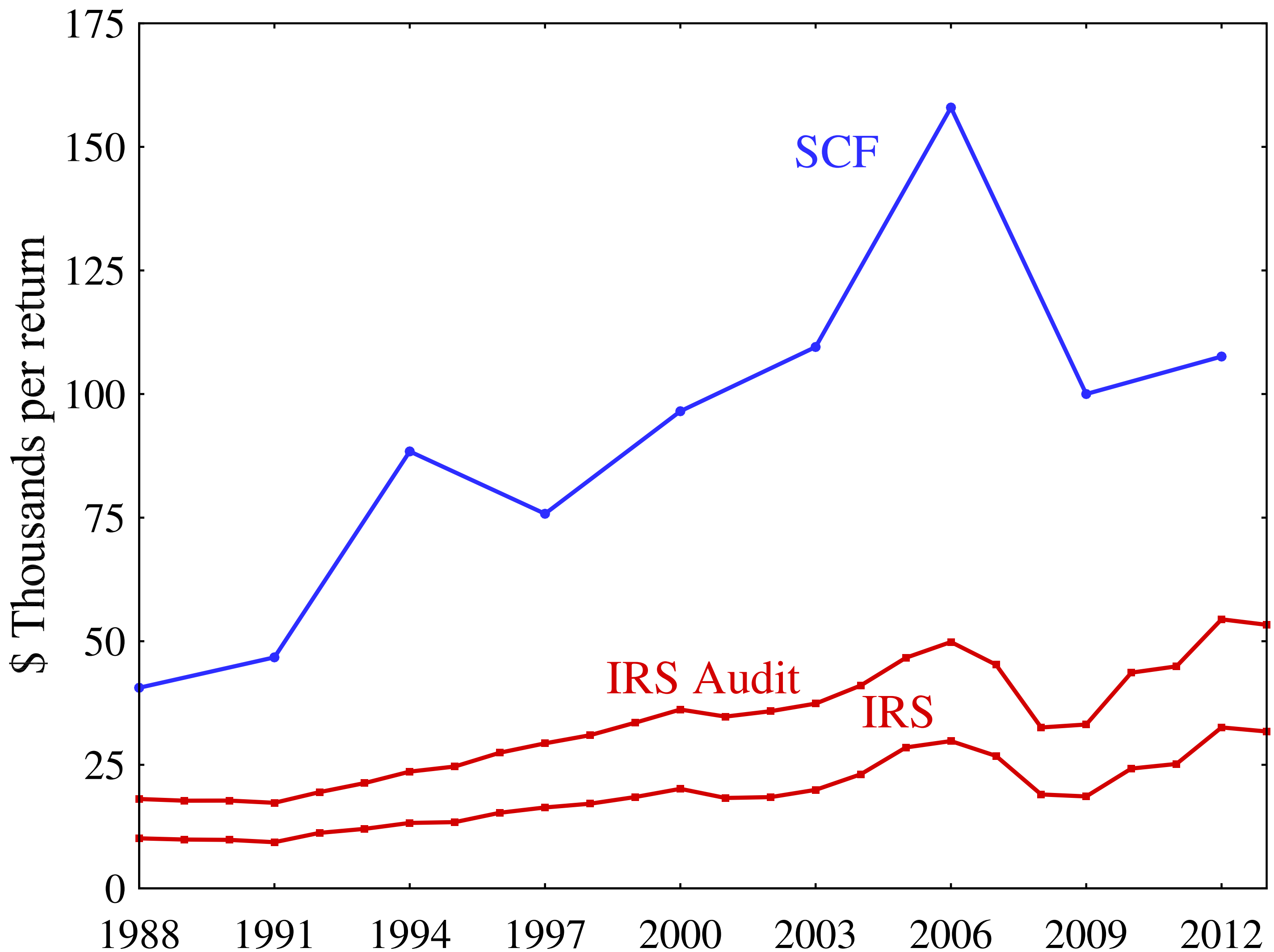

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SCF Income Yields Overstated by More

- Compare SCF to *Pratt's Stats*:
  - Transaction-level broker data for business sales
  - Includes purchase price allocation (for IRS 8594):
    - Cash
    - Fixed assets
    - Real estate
    - Identifiable intangibles
    - Goodwill

- NI/V average is 2%, compared to SCF 19%

  $\Rightarrow$ SCF respondents overstate NI, likely understate V

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  - Transaction-level broker data for business sales
  - Includes purchase price allocation (for IRS 8594):
    - Cash
    - Fixed assets
    - Real estate
    - Identifiable intangibles $\leftarrow$ 60% of value
    - Goodwill $\swarrow$ in intangibles

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  $\Rightarrow$ SCF respondents overstate NI, likely understate V

What Is Wrong?

- Sample weights wrong for businesses
- Errors in measurement:
  - Tax and other documents not referenced
  - Questions about net incomes confusing
- Problems exist
  - Even after adjusting for tax misreporting
  - Across surveys (SIPP, Kauffman, PSID, PSED)
- Impossible to get V for ongong concerns

Recommendations for Future Surveys

- Do not ask impossible questions
- Link responses to administrative data
- Design better samples for private business

"Fact" 3: Main Take-aways

- Private business returns are based on survey responses
- Current survey data on private businesses not reliable
- Measurement must be guided by tax data and theory
  - Construct same statistics in model and data
  - Resist drawing unguided policy conclusions