MEASUREMENT BEHIND THEORY

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Theory and Measurement

• In current “big data” era, still need
  ○ Theoretical lens
  ○ Econometric rigor

• Because not everything that counts can be counted
Theory and Measurement

- In current “big data” era, still need
  - 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
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

⇒ 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

Sales/COGS

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?

Source: Yao (2018)
A Related “Fact”

- Labor share is declining

- Evidence based on national accounting measure:

  Labor share of GNP
  
  \[ = \text{Compensation of Employees} + \text{fraction of Proprietors’ Income} \]
Labor Share Declining

Market Power or Accounting?

Market Power or Accounting?

Note: Differences are small given uncertainty about capital/labor income split in business
“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:

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

• 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

Return on DI of US
Return on DI in US

Avg Returns
USDIA: 9.3%
FDIUS: 3.7%

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 any 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 $\Pi$)
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
Return on DI of US

Return on DI in US


Avg. Differential
BEA: 6.3%
Model: 4%

“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:
    
    $$R_{t,t+1} = \sum_i \omega^v_{it} \frac{NI_{it}}{V_{it}} + \sum_i \omega^v_{it} \frac{V_{it+1}}{V_{it}}$$
    
    where $NI$=net income, $V$=value, $\omega^v_i = \omega_i V_i / \sum_j \omega_j V_j$
Private Returns Not Much Higher

- Evidence based on holding-period returns
  - CRSP publicly-traded:
    \[
    R_{t,t+1} = \sum_i \omega_i \frac{NI_{it}}{V_{it}} + \sum_i \omega_i \frac{V_{it+1}}{V_{it}}
    \]
    Income yield + Capital gain
  
- SCF private business:
    \[
    R_{t,t+1} = \sum_i \omega_i \frac{NI_{it}}{V_{it}} + \left( \frac{\sum_i \omega_{it+3} V_{it+3}}{\sum_j \omega_j V_{jt}} \right)^{\frac{1}{3}}
    \]
    Income yield + Capital Gain

where \(NI=\text{net income}, \ V=\text{value}, \ \omega_i^v = \omega_i V_i / \sum_j \omega_j V_j\)
Private Returns Not Much Higher

![Graph showing private and public returns over time](image)

Private Return (Avg 26%)

Public Return (Avg 22%)

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*

   ⇒ Can compare *NI* to IRS tax and audit data

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

   ⇒ Can compare *NI/V* ratio to businesses that sell
SCF Incomes Overstated ($\approx 5 \times$)

Source: Bhandari, Birinci, McGrattan, and See (2018)
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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
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 $\leftarrow 60\%$ of value
    - Goodwill $\hookrightarrow$ in intangibles

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

  $\Rightarrow$ 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 ongoing 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